THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal ESTABLISHED 1835 · THE RAILWAY RECORD.
RAILWAYS ILLUSTRATED · THE RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (8 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London as a Newspaper

VOL. 79 NO. 18 FRIDAY, OCTOBER 29, 1943

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DIESEL RAILWAY TRACTION SUPPLEMENT

The November issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, will be ready on November 1, price 1s.*

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

As from Monday next our office hours are:
Mondays to Fridays 9.30 a.m. till 5 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Railway Amalgamations

LAST weekend considerable prominence was given to a statement in a speech by an organiser of the Associated Society of Locomotive Engineers & Firemen, to the effect that great changes would take place soon in the railway world, and that he understood that negotiations were proceeding for the amalgamation of the four main-line groups into two. The statement was denied by Sir James Milne, General Manager, G.W.R., and Sir Charles Newton, Chief General Manager, L.N.E.R., who stated specifically that no negotiations were proceeding for the amalgamation of the four companies into two companies. It is possible that the Minister of War Transport may refer to the matter in the House of Lords shortly, during the course of a debate which is to be initiated by Lord Listowel, who has a motion on the Order Paper asking the Government whether plans are being prepared for post-war development and co-ordination of our national system of transport. In some quarters it is believed that during that debate Lord Leathers will make an important statement on post-war transport policy. In our view the future organisation and control of the railways will depend largely on the result of the first General Election after the war. As we recorded last week, the Prime Minister has said that a mandate would be necessary before nationalising coal mines; presumably the same would apply to railways.

The Locomotive Manufacturer After the War

Commenting on the increased production of locomotives by the British private builders, the City Editor of the *Sunday Express* pointed out recently that there is a mildly optimistic atmosphere in the industry, and added that when the time came the locomotive builders would be equipped and ready to cope with the flood of orders which peace would bring. An important development was stated to be the possibility of the British locomotive building industry getting a fixed quota of home railway requirements, which would provide a share of the home market sufficient to cover some of the overheads, and thus assist competitive power in foreign markets. The point has often been made that the absence of an assured home market has placed British locomotive builders at a disadvantage in competition with overseas builders, which supply engines for their home railways, but it is unlikely that any advanced stage has been reached as to participation by the private builders in this country in the supply of home railway locomotive requirements after the war. It is worth recalling, however, that before the war a proposal that the German State Railway should build its own locomotives was rejected and one of the reasons advanced was the disability suffered by the British locomotive industry because of its lack of a home market. There can be no doubt that at the end of the war there will be a very heavy demand for locomotives in all parts of the world, and the British industry is alive to the opportunities which will be afforded it of reassuming its one-time important position in British export trade.

Record Railway Traffic in Egypt

The special circumstances now prevailing in Egypt have enabled the Egyptian State Railways to record the highest receipts ever attained within a comparable period. For the nine months ended May 31, 1943, the increase in working receipts amounted to £E1,800,000, and 46,000,000 passengers were conveyed, or some 6 million more than in the same months a year previously. The number of passengers conveyed by the Egyptian State Railways in the month of May, 1943, was in the neighbourhood of 6,000,000, or some 900,000 more than in May, 1942, when a previous record figure had been attained, according to Mahmud Shakir Pasha, General Manager of the State Railways. Total receipts in May, 1943, aggregated £E1,115,000, or £E210,000 more than in May, 1942. The General Manager has emphasised that at present the average number of wagons hauled by a locomotive is 13, compared with an average of 10 before the war. An amount of £E350,000 was included in the new budget of the Egyptian State Railways for the purchase of new wagons. The transport boom now being experienced in Egypt has been responsible also for a rise in the quotation of the shares of the Menzaleh Canal Company from 5 piastres at the outbreak of the war to no less than 120 piastres in August last.

Sir Guy Granet and the Ais Gill Accident

The death of Sir Guy Granet recalls the special evidence he tendered to the late Colonel Sir J. W. Pringle at the latter's inquiry into the collision on the Midland at Ais Gill on September 2, 1913. This accident, in which 16 lives were lost, created a great impression on the public and led to much criticism being levelled at the railway company. It took place only a

short distance from the scene of the collision at Hawes Junction on December 24, 1910, in which 12 passengers were killed. After both accidents there was a fire. Major Pringle, as he then was, had made a number of recommendations and after the Ais Gill accident the Midland Railway, through Sir Guy Granet, asked to be allowed to state what it had done to give effect to them. The causes of the two collisions were different. At Hawes false clear signals were given, after standing light engines had been forgotten. At Ais Gill a starting signal was passed at danger. The Midland had embarked on an extensive programme of track circuiting and the fitting of its rotary interlocking block, and adopted improved and increased quantities of tools for emergency service in expresses. It had also introduced much better fittings in its gas-lighting equipment. The report on the Ais Gill collision spoke of "the thorough manner" in which the Midland had carried out the steps decided on, explained in detail by Sir Guy in his evidence, which also disposed of many rumours which had become current.

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Overseas Railway Traffics

Uncertainty in the political situation in Argentina led recently to some reaction in the prices of the stocks of the British-owned railways in that country, but this was followed shortly afterwards by a recovery. Traffic receipts have been well maintained and the increase in the 16th week on the Buenos Ayres & Pacific has now placed its aggregate takings on the right side. Gains in the 15th and 16th weeks of the financial year have been £46,029 on the Central Argentine, £31,980 on the Buenos Ayres Great Southern, and £8,280 on the Buenos Ayres Western. The Central Uruguay to date has secured gross earnings of £468,031, an improvement of £140,370. Brazilian railway traffics maintain the rises which have been a feature of recent weeks, and the aggregate receipts from January 1 to October 16 have been £654,300 on the Great Western and £1,421,480 on the Leopoldina, denoting increases of £217,900 and £161,276 respectively.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
		£	£	£	£
Buenos Ayres & Pacific* ...	16th	106,500	+ 19,500	1,368,300	+12,960
Buenos Ayres Great Southern*	16th	165,660	+ 15,300	2,258,700	+206,400
Buenos Ayres Western* ...	16th	59,640	+ 7,440	768,600	−6,000
Central Argentine*	16th	144,270	+ 24,732	2,046,573	+115,416
Canadian Pacific	41st	1,170,000	+126,400	45,604,400	+6,150,000

* Pesos converted at 16⅔ to £

On the United of Havana the aggregate takings for the 16 weeks of the financial year amount to £754,654, an improvement of £126,184.

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Mechanical Engineers' Presidential Address

With characteristic charm of manner, Professor Lea delivered his presidential address last Friday (October 22) to the Institution of Mechanical Engineers. With fifty years' professional experience to look back on, he gave his hearers a vivid comparison between conditions in the engineering world of the "nineties" and those of the present day. His most important personal contribution to this remarkable pageant of progress be modestly kept in the background; indeed it is necessary thoroughly to search the printed version to find any reference to it. However, in proposing the vote of thanks at the conclusion of the address, Dr. Ricardo reminded the audience of the vital strides forward in British air power, during the last war, which came after the adoption of certain light alloys for aero-engine pistons—the direct outcome of an investigation with which Professor Lea was identified. In listening to the address (published in abridged form on p. 435) we had the distinct feeling that he was saving until the end something which he considered especially important. So it was, for in concluding, he left us in no doubt of the very real sincerity with which he pleaded for the spirit of co-operation in national and world affairs generally—just as in similar vein, when surveying the more restricted field of engineering earlier in the evening, he had urged more effective co-operation between theory and practice.

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Safety and Wartime Traffic

A point which is likely to assume considerable importance in many parts of the world, when the war is over, is that during the years of war a new generation has grown up in complete ignorance of normal road traffic conditions, and often with a disregard for peacetime regulations. Some prominence was given to this recently by Mr. W. A. Podésta, of the Safety First Association in Dublin. He said that Dublin had become a city of chronic "jay walkers" during the last four years, and that pedestrians had forgotten the days of heavy motor traffic. They walked all over the main thoroughfares at night, and also crossed a street anywhere, and not at the regular crossings. With the return of heavier road traffic, and with newer and faster cars on the road, often driven by private individuals who have got out of driving practice as a result of petrol restrictions, it is probable that there will be an immediate, and perhaps even startling, increase in road traffic accidents. The only useful step that can be taken to alleviate the situation is to intensify safety education, and the responsible authorities should make preparations in their propaganda plans for the return of heavy road traffic to a pedestrian population that is mainly unprepared for it.

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The Rail Shortage in America

Among the maintenance needs of American railways, undoubtedly the foremost is for steel rails, and many railway executives are calling attention to the seriousness of the position. In April, Mr. R. B. White, President of the Baltimore & Ohio Railroad, said: "Only a shortage of rail can prevent the American railroads from establishing new pinnacles in wartime transportation"; a month later, Mr. Ralph Budd, President of the Chicago, Burlington & Quincy Railroad, declared that "the extremely severe use of the railway plant has caused rail to become perhaps the most critical of all our material problems." Before the year opened the railways had estimated their essential requirements for 1943 at 2,100,000 tons, but, in view of war demands, they reduced the figure to 1,800,000 tons. The War Production Board at first authorised 480,000 tons in the first quarter, but subsequently cut this figure to 400,000 tons; in spite of protests from the railways, the allocation for the second quarter was cut to 350,000 tons; and only 376,000 tons has been allowed in the third quarter. As a result of pressure from the Office of Defense Transportation, however, the allocation for the fourth quarter has been increased to 400,000 tons.

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German Private Railways Prosper

Increased traffic demands in Germany, resulting not only from the enhanced transport requirements of industry and the Armed Forces but also (and particularly so in recent months) from the wholesale evacuation and re-location of the population, were responsible for improvements in the traffic and financial results of the German private railways throughout the country in 1942. A survey of their financial results for 1942 shows that numbers of companies were able to pay increased dividends or to resume payments where none had been made for a number of years. Other companies, again, which had recorded a series of losses in previous years, were now able to reduce them. While there is no case of a company worsening its financial results in 1942, eleven companies actually increased their dividends and seven others resumed the payment of dividends. The best results throughout accrued from increased passenger traffic. This was the case also with railways situated in remote regions, because these constitute preferential reception areas for evacuees and for the re-location of industries. Purely tourist lines, too, shared in the general improvement as a result of the general liquidity of funds now to be observed among certain classes of the German population. Incidentally, a similar tendency to spend rather than to save (resulting from lack of confidence in the stability of the currency) was noticeable in Germany in the latter stages of the last war.

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Lighting and Staff Casualties

Comment is being aroused in American railway circles on the fact that, as the total number of men and women in the railway service rises, the casualties rise in a considerably greater proportion; conversely, as the staffs contract, so the casualty list drops with far more rapidity. For example, between 1931 and 1932, at the beginning of the depression, the total number of American railway employees fell by 30·7 per cent.; but the number of fatalities dropped by 63·5 per cent., and of reportable injuries by 53·1 per cent. During the present war the increase of staff from 1941 to 1942 was of the order of 24 per cent., yet it produced a 52 per cent. increase in fatalities, and no less than 88·6 per cent. in reportable injuries. It is obvious, of course, that with any increase in railway business there is likely to be a disproportionate increase in the casualty rate; the relatively inexperienced employees that must be taken on account in part for additional injuries and fatal accidents, as do also the speeding-up of work, and the changes that must be made in established practice. Lighting, however, has a considerable bearing on this problem. Even in peacetime conditions, railway lighting is seldom of the best, partly because railway operation covers large areas which it is difficult to light effectively. Recent American statistics show that after the average illumination of a certain plant was raised from 2 to 19 foot-candles, the frequency of accident dropped by 54 per cent.; in another factory with 1,000 workers, after the installation of a new system of lighting the accident rate fell from 425 to 170 annually.

Operating Levers at a Distance

The system of remote control of outlying signal boxes, recently brought into service by the L.P.T.B., and referred to on page 436, uses an ordinary power interlocking frame worked from a distance by electro-pneumatic mechanisms; the levers are reversed and restored to normal by air cylinders, the valves of which are controlled electrically by a signalman in another signal box. This amounts to giving him the means of reaching the levers in other signal boxes and actuating them as if they were immediately beneath his hands. No signalman needs normally to be on duty at the distant box, which is fully interlocked locally, exactly as if it were intended to be manned and worked like any other. The board's officers have come to the conclusion that it is preferable to disperse the equipment in this way rather than instal a single large signal box, as has been the practice previously when a considerable area was controlled from one point. The operation circuits, as they are called, connecting the directing signalman with the outlying location, serve only to initiate the movement there and convey indications back. They cannot influence the safety features of the equipment.

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The French "Postes Semi-Autonomes"

The idea of equipping an outlying location with a local group of fully interlocked equipment, capable of being operated by a traffic official on the spot in case of necessity, has been applied for some years in France on the Eastern Region of the S.N.C.F., where the former Eastern Railway Company—always to the front in signalling matters—introduced the *postes semi-autonomes*, or semi-independent interlockings, described in our June 11, 1937, issue, page 1118, and installed at Lagny-Thorigny, Belfort, Baroncourt, Onville, and elsewhere. In this case, however, the controls are sent out over a single circuit by coding—as could be done with the L.P.T.B. apparatus, if desired—using telephone dialling; the equipment at the outlying location takes the form of relay interlocking and there is no power frame. The indications are similarly conveyed back by coding out and "exploring" the conditions at the distant location. This is no doubt satisfactory under the very different traffic conditions obtaining, compared with the heavily-worked L.P.T.B. lines.

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Locomotive Power

Because of the many variable factors that affect locomotive performance, an accurate forecast of what this performance will be for a new type, in any given circumstances, is very difficult to make; many investigators have devised formulæ for the purpose, based partly on first principles, and partly on the results of actual trial, but so far none has been found sufficiently reliable for general application; consequently, the search goes on. In a paper entitled "Locomotive Power" recently delivered before the Institution of Locomotive Engineers, Mr. E. C. Poultney outlined a method of predicting performance from a knowledge of firing rates. Making certain assumptions, and using relatively simple classic formulæ, he worked out the performance of such well-known engines as the L.M.S.R. and L.N.E.R. Pacifics, also the Southern Railway "King Arthurs" and the British 2-8-0 "austerity." For some types there was sufficient information from actual trials to enable the author to gauge the accuracy of his method; as this seemed debatable the paper offered opportunities for a good discussion. The probability is that in experienced hands Mr. Poultney's method would give an estimate as close to reality as any, and closer than many, but much must depend on the right choice of arbitrary constants in the various formulæ.

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Basic Bradshaw

In quite an early concession to the present demand for simplicity, "Bradshaw" pruned its columns of much of the letterpress which once gave them charm. Resounding phrases like "luncheon, tea, and dining cars" gave place to a modest "RC," covering all refreshment facilities other than those of the buffet car (which might have become "BC" had it survived until now). Through carriages became, and remain, "TC," which means not only coaches detached to pursue their way to destinations off the route of the main train, but is applied now to trains as a whole. What was once the Royal Scot today inspires "Bradshaw" to nothing more eloquent than "TC London to Glasgow." It is hard to recognise in such laconic phrases the authorship that as recently as the summer of 1939 spread itself to the extent of writing. "Through Corridor Express" to describe the L.N.E.R. 10 a.m. from Bradford to Marylebone *via* Penistone, determined that the absence of dining facilities between Bradford and Penistone should not deprive the train of a little letterpress to distinguish it from shorter distance services in adjacent columns.

Railway Maintenance

FEW appreciate the thoroughness of the arrangements that are made to provide for the depreciation of wasting assets on the railways. The term "maintenance" covers all charges in the year for wastage of the property, whether made good or not. The charges vary according to the type of asset. Certain things can be kept in existence indefinitely by repairing parts, for example, a pavement. Others can be continued only by replacing parts as they require it, for example, electric lamps. Others, again, such as steamers, must be completely replaced as they become worn out. These three broad divisions are described as repairs, partial renewals, and complete renewals. Generally, repairs and partial renewals are charged to the period in which the work is performed. Complete renewals are met by provisions set aside annually from revenue (based on the average annual liability during the life of the assets) and held in the renewal funds until spent or used to write out capital outlay where the asset is displaced without renewal. The provisions are normally made on the basis of replacement cost and therefore the revenue expenditure accounts meet increased costs due to rises in prices. This would not be the case if the old asset were simply written out of capital and the new asset charged to capital in its place. The function of the railways is to sell services, and in this they differ from other industries; it is therefore incumbent on them to maintain the railway to permit them to perform their services.

The provisions for maintenance stand in the balance sheets under the generic description of renewal funds, and if surplus to requirements the excess is returnable as a credit to the revenue expenditure from whence it came. The provisions are an ingredient in arriving at the net revenues of the year. The actual outlay is shown in the revenue expenditure accounts with an addition or deduction, as the case may be, for the net amounts transferred to or from the renewal fund in the balance sheets. For example, if a railway company sets aside £100,000 a year for the wastage of a particular group of assets and spent in a year £90,000 on renewals of them, the £100,000 would not be shown in the renewal fund, but £90,000 would be shown as spent in the revenue expenditure account and £10,000 would be shown as added to the renewal fund. The annual statements submitted to the Railway Rates Tribunal reconcile these transfers with the changes in the balance sheets. Before the war, £50 millions a year was charged as maintenance in the railway accounts, and of this roughly 70 per cent. was for repairs and partial renewals, and 30 per cent. complete renewals.

During the last war, the railways charged as a working expense, year by year, the sums which they charged in 1913 for maintenance of permanent way and rolling stock, increased or decreased for variations in the quantity of assets in use, plus an allowance for increased cost due to the rise in prices between 1914 and 1921—the period of control in the last war. This was appropriately reduced by the actual expenditure incurred during the period, so that the amount due to the railways at the end of the war represented the arrears plus the increased cost of making them good. The latter allowance was a provisional figure of 15 per cent. of 1913 prices, and at the end of control the Government was under obligation to adjust this figure. The railway companies, however, agreed with the Government that a lump sum payment of £60 millions should cover all outstanding liabilities in respect of the war period. The liabilities were not defined, but included claims of all descriptions which might have arisen out of Government occupation, and specifically covered the adjustment of the 15 per cent. mentioned, to then current prices.

In addition to covering payments for arrears of work on permanent way and rolling stock, the £60 millions also covered 100 per cent. of the arrears for maintenance of all other assets (such as docks and steamers) and, in addition, all liability for abnormal wear and tear due to the greater rate of wastage of the assets of the undertaking during the war than in 1913. The other liabilities settled by the payment of £60 millions do not concern the question of maintenance.

In the present war, the agreement provides that all items of maintenance, and not merely those charged as maintenance of permanent way and rolling stock, are to be charged to the control account on the basis of the average amounts expended in the years 1935, 1936, and 1937, with adjustments for variations in assets, plus the estimated increased cost of doing the work. The figure is cumulative and, in effect, the current expenditure is converted into terms of prices in the base period, and the difference between that and the expenditure in the base period, with an addition for the current increase in prices, is chargeable as arrears of maintenance to the control account. The addition for increased prices is reviewed regularly, so that the accumulated arrears at any date represent base-period prices plus increased cost, and the final figure for increase in costs is a matter for settlement after the war.

No amount is at present charged for abnormal wear and tear compared with 1935-6-7 due to the greater use of the assets during the war and the different conditions under which railway operations can now be conducted and to any other abnormal factors. War damage is right outside the arrangement and dealt with by separate arrangements not yet in final form. The accumulated arrears, month by month, are paid into trust funds in the names of the Government and the respective railway companies, and, as the reverse process occurs and arrears are overtaken, the trust funds will pay for these. The arrangement is more simple than that in the last war, as, apart from the question of greater wear and tear due to the tremendous increase in the use of railway equipment compared with the base years, provision is made currently, in ascertaining the net revenue paid to the Treasury, for the work which will require to be made good after the war.

With base period maintenance charges representing £50 millions and assuming that prices since then had risen 50 per cent., £75 millions is the current amount chargeable to the control account for maintaining the railways, again ignoring abnormal wear and tear. The trust funds of the four companies at December, 1942, aggregated £54 millions (including receipts for lost assets such as rolling stock sent to France and steamers); and in broad terms it may be said that the aggregate chargeable arrears which have accumulated represented about 70 per cent. of a year's work at that date, and by now is no doubt nearing 100 per cent.

For things such as rolling stock, ships, and machinery, the period of time in overtaking these arrears should not be very long and will, to a large extent, depend on the available supplies of machine tools, labour, and materials, but for things like permanent way and bridges which can only be made good with interruptions of the services which are running all over the country throughout the 168 hours of the week, overtaking arrears will be a slower job, bearing in mind that the ordinary work will be accumulating at the same time. For example, in 1938, 1,440 miles of track were completely renewed, and the arrears of renewals of track, in addition to current requirements, will obviously take some years to perform. Overtaking arrears, plus ordinary work, will require a very heavy expenditure for some years after the war, an expenditure which will be a substantial help in the period of reconstruction, after production for the armed forces has ceased.

Is the Turning of Locomotive Tyre Treads Necessary?

WE understand that in the U.S.A. it is not normal practice to put the tyres of locomotive and tender wheels in a wheel lathe and turn the tread to a particular diameter. The inside of the section admittedly is bored to receive the wheel centre; but there the operation ends, as it is contended that the rolling of the tyres in the steel works during manufacture is carried out to a degree of accuracy which renders any further machining of the tread quite unnecessary. The matter is of unusual interest at the present time, for we have now the phenomenon (without parallel since the year 1900) of American-built locomotives arriving in large numbers for service in this country.

We have also heard that in some cases, in order to secure conformity with British practice in profiles, the wheel treads of some of these American engines have been turned in lathes after arrival in Great Britain, involving a considerable amount of time and labour, during which, moreover, the engines concerned are out of service.

Is it really possible to roll the treads of tyres so accurately, both for concentricity with the inner surface and for conformity to the specified profile, that no further removal of metal is necessary? If so, it would seem that, since the beginning of high-class rolling-mill performance, British engineers have been indulging in what is no more than a costly luxury. The American viewpoint, we are given to believe, is that the turning of wheel treads is of little use anyway, for if tyres newly turned are compared with those of even a new engine after a few weeks' service, the difference in profile (in deviation from the original) is positive proof of the futility of trying to get conformity to a particular contour.

There are, however, a number of factors which have a bearing on the turning of wheel treads, one of which is the need for all the coupled wheels in a locomotive to be of the same diameter on tread (within practicable working limits) if unaccustomed stresses in the frames, etc., and consequently increased maintenance, is to be avoided. For instance, if one in a set of six coupled wheels differs from the other five by anything more than about $\frac{1}{32}$ in. in diameter, the disturbance both in frames and coupling rods may be serious under certain conditions. Within one wheel, a much finer limit is needed in gauging for circularity. The permissible variation between one diameter and another in a given wheel is nowadays limited much more strictly than was formerly the case in British practice; the amount varies in different works, and also depends on the duties for which the engine is intended, but is generally less than 0·010-0·015 in. Eccentricities above this amount tend to set up considerable forces in the engine at speed, and to upset the balancing arrangements. American practice, however, reduces diameter differences to a minimum by grouping sets of tyres. A further vital point which affects this matter is the American practice of pushing the wheel centre further home instead of thinning flanges, thus reducing the distance between tyres and the clearance in the flangeway, particularly at points.

One piece of good fortune in this connection is that, barring accidents, a wheel tread, once turned circular, will remain circular, even after considerable wear has taken place. In stating this, no allowance is made for chance damage, such as the "skid flats" which are produced when the brakes are sharply applied so that the engine slides along the track with all the wheels locked. The "shelling" of tyre treads, though rather a metallurgical defect than actual "damage," is another form of surface deterioration which may in time affect the true running of the wheel.

We are conscious that there is more in this subject than meets the eye, although it would seem that the safest and most satisfactory method is to turn all tyres to specified dimensions; if only as a guarantee of satisfactory performance in service. To expect equally good performance from tyres going into service with a rolled tread, we feel would be to place undue reliance on the quality of the rolling, and might lead to a rise in maintenance costs against which the costs of turning the treads would appear insignificant. The profile and distance between tyres, however, is another subject, and the question of clearance between tyre and rail is, we believe, receiving attention in America.

Government Control in the Post-War Years

ON October 3 Mr. Herbert Morrison made one of his clear and incisive speeches at Dundee. His theme was that the wartime system of Government control over trade and industry would have to be continued after the war, "subject maybe to suitable and sensible modifications, for as long as abnormal conditions persist." So long as there were shortages, he said, rationing would have to continue both in industry and in the shops. Materials for industry, if they were in short supply, would have to be directed under public control to the points where they were most needed. Industries which were in need of help would have to stay under public control.

If Mr. Morrison's remarks had stopped there, they would hardly have been open to criticism. As *The Times* commented in a leading article on October 6, "every sensible person understands that some controls will have to be continued for an appreciable time after the war, if unimaginable chaos is to be avoided," though there was room for difference of opinion about the extent and the duration of control required. The Home Secretary, however, was not content to deal with the time of transition from war to peace. He went on to argue that the positive side of public control and the use of State power lay in the adoption of a programme of full prosperity under the necessary measure of public guidance and regulation. Besides plans for full employment we needed increased productivity for industry and agriculture. Before the war, he asserted, many of our great industries fell far short of the efficiency of their opposite numbers in America. We had made up some ground in the war—under public control. We had a lot more ground to make up yet and he was convinced that "strength and wisdom in continuing the policy of national economic self-discipline offered us the chance to begin refashioning our economic life on an altogether better basis."

This second portion of Mr. Morrison's address practically amounts to a plea that the restraining grip which the State necessarily maintains on the country's activities during the war should not be relaxed after the next general armistice, but should be extended as a substitute for private enterprise. If our interpretation is correct, the speaker can be considered only as expressing his own socialistic views and in any event his line of argument is curious. Because America, where people enjoy the greatest possible degree of freedom, is enterprising and always ready to try new ideas and inventions, we are asked to believe that our industries can best be improved under public control. Has Mr. Morrison forgotten that before the war we had to go to America to find out how our Post Office methods could be vitalised? Our telephone and telegraph systems had become inert under years of State management. A searching inquiry brought about some improvement, but our system of

long-distance communication cannot rival the facilities which are at the service of the American people. With regret, it must also be admitted that years ago Germany had developed the telephone, both for public and for railway purposes, to a degree of perfection unknown in this country.

Mr. Morrison appears also to forget that, during the period of wartime controls, there has been an extraordinary outburst of sustained energy on the part of thousands of privately-owned concerns. As Mr. Geoffrey Lloyd, Chairman of the Oil Control Board and Petroleum Secretary, said at Peterborough on October 6, it is easy to overrate the contribution of government power and to underrate the contribution of popular energy even in the extraordinary circumstances of total war. England was made by independent men, Mr. Lloyd said, and what we wanted was more of them and more prone "to make adventure."

Certainly it cannot be argued that the credit for the great work which our railways have done during the past four years should go to government control. The existence of control has made it easy both for the Ministry of War Transport and the railways to deal with such matters as the requisitioning of private owners' wagons and the construction of additional works for war purposes. In wartime the responsibility for settling traffic priorities falls on M.W.T., but the actual operation and maintenance of the railways has been carried out entirely by the four main-line companies and the L.P.T.B., working in unison under the guidance of the Railway Executive Committee on questions of common interest. There has been free co-operation between the companies as to the working and routing of traffic without the intervention of the R.E.C. as agent for M.W.T. Only in that spirit could the difficulties due to changes in the volume and flow of traffic, and to enemy interference, have been surmounted.

In June last Mr. Morrison told the annual conference of the Labour Party that after the war common service industries, such as transport, must be publicly owned. He does not appear to have referred specifically to transport undertakings in his oration at Dundee. Perhaps that is fortunate, because it was at Dundee in December, 1918, that Mr. Winston Churchill led the electors to think that the government of Mr. Lloyd George had decided to nationalise the railways! Once again the government in power at the end of the war will have to face the question of improving and stabilising our transport system, but we venture to doubt whether they will seriously propose either to keep the railways indefinitely in leading strings, or to convert them into a State department like the Post Office. As soon as peace returns the public will demand the restoration of the excellent facilities which they enjoyed before September, 1939, and we cannot see how these will be forthcoming under any form of State management such as we have had experience of in this country—for example, the Post Office.

Of course as is well known, we have State railways managed efficiently in some of the Dominions and Crown Colonies, but most of these lines were constructed in circumstances which had no parallel in the development of our railway system. Traffic requirements overseas also differ widely from the demands made upon our main-line companies, so that it is not easy to make a valid comparison of working results. Our railway problem has its own peculiar features and cannot, in our opinion, be solved simply by adopting methods which have been attended with some measure of success either in other parts of the British Empire or on the Continent.

Scientific Research in Industry

THE committee appointed in November, 1942, by the Federation of British Industries to consider scientific research in relation to industry, has made its report, which has been adopted by the Grand Council. Sir William Larke acted as Chairman of the committee, and it has covered a broad field in its investigations. Its report makes an important contribution to a subject which must assume a vital place in the national economy if Great Britain is to take its rightful place in the post-war world. It is a truism that most of the industries on which our modern civilisation is based have their origin in the industrial research and development which has taken place in the United Kingdom. Many of our industries, notably the electrical and chemical, are wholly based on continuous research, and could not have been brought into existence, or maintained, without it. The railway companies of this country well understand the value of continuous research, and some examples of the steps they have taken were given in an editorial article in our October 1 issue.

It is generally conceded that the two major tasks with which industry will be faced after the war are the provision of the greatest measure of employment for the people of this country and the achievement of the highest possible flow of exports. It is declared that application of research is a certain means of increasing employment by the improvement of existing and the creation of new industries, and conversely, the lack of it spells stagnation and ultimate bankruptcy. It calls for devotion of resources to the initiation or furthering of research and development by individual producers within their own organisations, the giving of their own research staff an appropriate position in the hierarchy of that organisation, and also the support of the collective research organisation of their industry. It declares: "Money cannot create a Faraday, though it may provide facilities for his development," and goes on to say that there is now a greater awareness of the importance of research.

The global results of an inquiry carried out by the committee show that in 1930, 422 firms were spending £1,736,000 on research and development; in 1935, 484 firms were spending £2,696,000; and in 1938 566 firms were spending £5,442,000. Scientific graduates and other technically qualified personnel employed wholly or mainly on research and development in 1930 by 384 firms numbered 1,381; similar personnel employed in 1935 by 432 firms numbered 2,566; and in 1938 the research personnel of 520 firms number 4,382. These figures are by no means complete and are considered to understate the true position. It will be seen, however, that the cross section examined shows that a considerable increase in expenditure on research took place over the period covered, and there can be no doubt that the value of the disbursement will be well worth while. Indeed, expenditure on research and development may be likened to a reserve for depreciation of goodwill.

The committee makes a number of recommendations. It suggests that every manufacturing firm should take stock of its position to ensure that it is devoting to research and development the maximum effort and funds, commensurate with the nature of its problems, that wherever possible it should maintain its own research department, and in any event it should entrust one or more suitably qualified individuals with the responsibility for keeping constantly under review the application of research to its activities. Firms comprising industries which have their own collective research associations should give the most careful consideration to the question as to whether they are making a contribution to that association, either in money or in other ways, commensurate with the work which, if adequately supported, it could perform in furthering the interests of the industry as a whole.

Dealing with the Department of Scientific & Industrial Research it is recommended that it should make the maximum use of its wide powers, both as to the amount of grant which could be made available to associations, and as to the eligibility for grant of types of organisation for collective research, which although not research associations in name, are, in fact, fulfilling similar purposes. It is also recommended that financial provision should be made from public funds to enable the department to increase and continue indefinitely financial support to research associations and similar organisations as a permanent feature of the national economy. The Government, it is suggested, should allocate to the department at least £1,000,000 a year for the maintenance and extension of its activities. Expenditure on research should be chargeable against revenue, either immediately, or over the commercial life of any assets created; any narrow interpretation of what is allowable expenditure for taxation purposes is bound to have a deterrent effect on research. Finally, the establishment of a Bureau of Industrial Research is recommended. This should be national in scope and, though financially supported by those principally concerned, such as research associations, independent scientific research laboratories, Governmental research establishments, and universities should be objective in its activities.

The report has some interesting comments to make on the relations of research associations to subscribing members. In this connection it states that it is important that the director of research and his staff should be capable of setting out the results of research in a readily assimilable form. It is, for example, useless to publish scientific reports in a language which the technical personnel cannot assimilate, and which does not point directly to methods of applying the conclusions of the reports to the technical processes in the industry for which they are made. Some research associations maintain a liaison or development department specially charged with advising on how the results of the association's investigations can best be applied to the circumstances of individual firms. The success of this depends on the degree of co-operation forthcoming from the firms themselves. There is, however, a great deal to be said for clarity in the exposition of scientific problems, and it is perhaps opportune in this connection to suggest that it is good for the expert to indulge in an occasional interval of lucid exposition. Until this becomes a more common practice, it is unlikely that scientific research will attract the public appreciation and support which it merits, and which is essential to securing its maximum advantages.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A National Transport Programme

79, Woodcote Road,
Caversham. October 10

To the Editor of The Railway Gazette

Sir,—I have just been reading the pamphlet "A National Transport Programme" with the foreword by Sir James Milne, and the article in the October 8 issue of *The Railway Gazette* entitled "The Future of Transport." By a coincidence, I happen to be reading John Buchan's book "Memory hold-the-door" on p. 230 of which he writes:—

> "But my strongest conviction was that the area of public service should be extended, and that the ordinary citizen should be given the chance of an active share in the work of administration. I believed that the policy represented by organisations like the B.B.C., the Port of London Authority, and the Central Electricity Board, was our natural line of development—public utilities privately administered but authorised and ultimately controlled by Government."

I thought that in the circumstances such an authority would be of interest.

Yours faithfully,
J. W. ENSER

Crossing the Alps

137, Icknield Way,
Letchworth. October 12

To the Editor of The Railway Gazette

Sir,—With reference to your article "Crossing the Alps" in the issue dated July 20, 1943, electric traction was in operation through the Mont Cenis tunnel considerably earlier than 1920.

When the British and French went to the assistance of the Italian Army in the autumn of 1917 all traffic through the tunnel was worked by electric locomotives. The Italian State Railways timetables for December, 1917, state: "*Treni a trazione elettrica fra Modane e Bussoleno.*" This is a distance of 60 km. The same note is given in the timetables for 1918 and 1919.

Evidently electric traction was extended from Bussoleno to Torino (Turin) in 1920, but I have not access to a timetable for that year, nor for 1921. The tables for 1922 show electric traction in operation between Modane and Torino.

Yours faithfully,
H. V. BORLEY

[We have been able to refer this to one of our correspondents in Switzerland, who replies: "Electric traction was established in the tunnel in 1915, when the ventilation system (installed in 1903 to replace the original faulty system) was dismantled.—Ed. *R.G.*]

Transport and Its Track

London, S.W.3.
October 13

To the Editor of The Railway Gazette

Sir,—Mr. S. Macdonald's interesting letter in *The Railway Gazette* of October 1 calls for comments, some of which I should like to offer. He asks whether anyone can say that: (*a*) our railways are well laid out to suit the country, and (*b*) the £700,000,000 sunk in track was wisely expended?

Considering the first question. Mr. Macdonald does not mention the point that the country today is a vastly different place from what it was when most of our main trunk lines were laid down. Given a clean sheet, and an accurate foreknowledge of how and where industry would—or could be made to—develop in the course of a century ahead; and foreseeing the advent of the internal-combustion engine in its modern form, it would have been feasible and practicable to have laid out a complementary system of rail and high-roads which would have got the best out of each; but such prescience is given to few.

(*b*) The answer to the question of whether the capital sunk in track was wisely expended or not depends on the sense in which "wisely" is used. Does it mean that fair value was obtained in respect of construction materials, land, etc., or does it mean that the same length of track could have been laid, at the same cost, but located to better advantage? If the former, then the answer is that the track and its accessories could not be replaced today for anything like the figure of £700,000,000. If the latter, then, given the prescience referred to earlier in this note, there is no doubt that it could have been spent to much better advantage.

Mr. Macdonald says, "It is the total cost that counts in transport." True; we will all agree; and not in transport only, but in every industry it is the total production cost of the finished unit of manufacture which is the basis of the economics of the business. The "finished product" of the transport industry is the conveyance of something from somewhere to somewhere else; and a convenient unit is one ton carried one mile. (To be complete, the unit should include a factor of speed, because speed of conveyance is a marketable commodity; and the unit of produce might be one ton, carried one mile, in one minute.)

It is understood that the unit refers to net, or "paying" ton-miles: the deadweight which has also to be moved in the process is no concern of the consumer, who is interested only in his ton of merchandise. In fact, the carriage of one paying ton of freight one mile entails the average movement of about 2·8 tons for the same distance; the transport of one ton of passengers (reckoning them at 15 to the ton) involves the movement of about 23·6 tons. (These averages result from the Ministry of Transport returns.)

However, accepting that the unit is one ton-mile, then the average total cost (all paying traffic—including weight of passengers—lumped together) works out at about 1·8d. per unit. It might now be useful to break up this total into its component parts, to find the "impact" of each on the whole. For the purpose of Mr. Macdonald's argument, and using his figures, plus an allowance for actual weight of passengers carried, the "impact" of the cost of track, at £26,000,000 a year is 0·34d.

This, then, is the unit price which the rail haulier pays for the privilege of having his own private road, and I suggest that it is insignificant in comparison with the benefits accruing from it; it enables him, within physical limitations, to move each load as he chooses, at speeds that he selects, with the very minimum expenditure of man power and fuel. (Four men in charge of one goods train could easily take care of the transport of 400 net tons, 400 miles, in one working day.)

(3) Later, Mr. Macdonald suggests—but I suspect him of trying a leg-pull—that railway tracks should be taken up and the road-bed converted into super motor-tracks. I will not deal with the proposition, beyond quoting from Mr. Louis Lockners' recent book, "What about Germany," in which he says:—

> "The longer the war lasts, the more evident it becomes that Hitler bet on the wrong horse in devoting the nation's energies, so far as transportation is concerned, chiefly to the construction of super-highways rather than to the improvement or even the upkeep of Germany's complicated railway system."
>
> "This was admitted in an editorial in the *Frankfurter Zeitung* on March 8, 1942: 'This war and particularly the third winter of war have proved that the railway has remained the decisive means of transport both for the necessities of the fighting troops and for all modern civilian economy. The reputation of the railway had temporarily been dimmed by several stars on the transportation firmament which had flared up later; to-day it shines all the more brightly.'"

Yours faithfully,
X. G. M.

The Midland Railway

21, Briarfield Road, Tyseley,
Birmingham. September 30

To the Editor of The Railway Gazette

Sir,—"Midlander's" letter in the September 24 issue was most entertaining and revived old memories of the splendid tradition and general excellence of the Midland system throughout, and it was, indeed, a tragedy that the amalgamation of 1923 should have brought something of an end to this noble tradition. Apart from the well-maintained stations, signals, rolling stock, and other equipment, the Midland Railway Company's locomotives were perhaps the cleanest, smartest, and indeed most carefully maintained in the whole country. No engine was ever "thrashed," or worked beyond the limits of its capabilities, and to ensure this, a system of locomotive power classification was adopted (which became general throughout the L.M.S.R. in 1923). If the train was only slightly beyond the engine's capabilities, then an assistant engine was readily obtainable; thus M.R. engines consigned to the scrap heap were few and far between. Every engine was equipped with full set of tools, bucket, and fireirons, etc., which were always stamped with the number of the engine they belonged to, and the lamps carried the engine number and name of the depot to which it was stationed, thus all equipment was accounted for, and there was very little wastage.

When an engine was returned to the works for repairs the regulations were that engine and tender must be returned complete with lamps, tools, cab tarpaulin, and fireirons, and if these were not forthcoming the running shed foreman had to give a very good reason. The M.R. was the last company to retain the "single" wheel express engine in service, and it is safe to say that had not the amalgamation taken place, Samuel Johnson's "Midland Spinners" would have given several more years' service instead of being condemned to the scrap heap. The favourite of many, they were perhaps with the exception of John Ramsbottom's diminutive "Problems" and Patrick Stirling's celebrated "Eight 'Footers" the most elegant and handsomest of the British "Single" express engines. Shoddy

materials or unskilled workmanship were unknown at Derby; they were always of the highest possible order. Thus today, after nearly 40 years of unfailing service, Richard M. Deeley's 3-cylinder compounds of 1905-6, and the "483" class superheater engines of 1913 (with only minor modifications) are the present standard L.M.S.R. 4-4-0 express type; this can be attributed only to their careful maintenance together with their sound and sturdy design and construction.

A veteran driver once remarked that the Midland engines were made to be *driven* and not to have their lives thrashed out of them; this was in 1924 when M.R. engines, Nos. 557, 765, and 1033 were tried on the L.N.W.R. for the first time. To the M.R. goes the honour of having the oldest locomotive in regular British service. This is Matthew Kirtley's 2-4-0, No. 20002, built in 1866 and which has covered over 1,500,000 miles—surely a fitting tribute to the company's Derby Shops.

Your correspondent mentions the premier line and that the Midland Railway did not lay claim to any similar title in its advertisements. This may have been so, but it is perhaps as well to recall that the London & North Western Railway claimed, and quite rightly so, to be the premier line of the British Isles, but this was never put out in any of that company's advertisements.

Yours faithfully,
A. RICHARDS

"Kelly's Railway Guide"

Northwood, Middlesex. October 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—*Kelly's Railway Guide*, about which Mr. G. A. Sekon enquires in your issue of October 8, was first published in December, 1858. In arrangement it was similar to the *A.B.C. Guide*, but in shape it followed *Bradshaw*. On the buff coloured paper cover was printed "*Kelly's Railway Guide* for December, 1858, containing the clearest information respecting Railway Routes, Stations, and Fares, etc., etc., of Great Britain. Printed and Published by Kelly & Co., Post Office Directory Offices, 18 to 21 Old Boswell Court, St. Clement's, Strand, W.C., and sold by all Booksellers. Price Sixpence."

In the December issue the large folded map of London engraved for the *Post Office Directory* was inserted, but in subsequent issues of the timetable the map provided was a special railway map of England and Wales, and the words "With a new map of England" were added to the title on the cover. Some pages called "The Traveller's Scrapbook" were added in the January, 1859, issue ("calculated to afford amusement during the journey"), and also a list of steam vessels leaving the Port of London. These, with variations, were repeated in the subsequent issues.

The following interesting note appeared in May and June: "The Proprietors are so confident that this guide has been accurately compiled from the railway timetables that in case it can be shown to their satisfaction that any mistake has been made by them in the compilation, and that any purchaser has thereby paid any railway fare which he would not otherwise have done, they will undertake to repay such fare."

Kelly's Railway Guide was published for seven consecutive months, and a complete set is preserved in the Library of the British Museum.

Yours faithfully,
REGINALD B. FELLOWS

Glories of the Past

Bordyke, Burgess Hill,
Sussex, October 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The article in your issue of October 1, must recall pleasant memories to the diminishing numbers of your numerous readers who recall the "Glories of the Past," in the years before the formation of the four trunk railways and the L.P.T.B. The older one happens to be, so more abundant are these memories.

The article says "Every railway, small as it might be, created and maintained its personality with colour, style, and slogan." The original ownership of coaches in the steam passenger trains, for many years after the amalgamation, could easily be identified by railway enthusiasts acquainted with the rolling stock of the S.E. (and Chatham), L.B. & S.C. and L.S.W. railways. That of the S.E.R. could be sub-divided into S.E. and L.C. & D., but not much of the latter survived 1922. The last I saw of it was about 10 years ago, when in the Christmas week (at Cannon Street, I think) was a train composed of about eight of the little 4-wheel thirds of the L.C. & D.R. formed into a parcels train.

In many cases the curves of the roof of carriages were sufficiently pronounced to fix the origin of these vehicles. Other small differences, however, come to mind such as (*a*) louvres on doors, (*b*) quarter lights, and (*c*) handholds on sides of coaches level with door handle, on the Southern Railway.

(*a*) South Eastern plain enclosure, only open at bottom. L.B. & S.C. like S.E.R., but embossed to look like narrow slats, with rounded ends. L.C. & D.R. slats with square end. L.S.W.R. imitation slats, more in number than L.C. & D.R. with rounded ends.

(*b*) S.E.R., L.B. & S.C.R., and L.S.W.R., rounded corners, L.C. & D.R., rectangular.

(*c*) S.E.R. curious curved shape about perpendicular at top and horizontal at bottom, L.B. & S.C.R. perpendicular, long, and curved top and bottom, reached to about level with middle of door droplight, L.C. & D.R., and L.S.W.R. perpendicular, right-angle fixing top and bottom. A few S.E.R. 10-compartment bogies, had L.C.& D.R. type of quarter lights and handholds.

The door handles also differed, some L.S.W.R. sloped, instead of being horizontal.

The last of the drop (road-coach type) with oval ring handles on S.E. first class carriages, disappeared, so far as I remember, about the time of the S.E.R. and L.C. & D.R. working union—the companies were never amalgamated.

Yours faithfully,
G. A. SEKON

Luggage on the Roof

Essex House, Essex Street,
London, W.C.2. October 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The inconveniences of the survival from coaching days of roofing luggage are expressed by Mr. George P. Neele in his "Railway Reminiscences" (London 1904). Under the year 1862 (at page 105) he says:—

> "While (on the West Coast Scotch expresses) the ordinary guards were responsible for the proper working of the van in their own charge, the conductor (a special official on these expresses chosen from amongst the smartest guards) was specially responsible for the luggage going through to Scotland, and in early days had a waybill of every package. Much of this luggage to avoid change on the journey (for the vans did not run beyond Carlisle) was roofed on the carriages and strapped down under heavy tarpaulins; the night passengers at stations like Preston, with its then very low platforms, experienced very rough thumpings of heavy packages on the carriage roofs. Luggage slides were in use for lowering the articles and broad steps to enable the men to pass up trunks, etc. from the platform to the men attending to the roofs. Mishaps were not infrequent owing to striking bridges through careless loading, luggage overhanging and falling off through getting out of position by oscillation while travelling, fire arose from engine sparks and frequent annoyance was experienced through the carriage lamps going out, their supply of air being cut off by close packing of luggage. I had the satisfaction of seeing this roofing of luggage, a relic of old coaching days, gradually but entirely dispensed with, the manager agreeing to adopt the plan of a separate luggage compartment in the centre of the passenger carriages similar to those I had observed in Birmingham on the North Eastern Railway stock. Amongst the first vehicles to be so furnished were the new composite carriages of what were called the West Coast Joint stock distinguished by initials W.C.J.S."

In regard to the N.E.R. pointed out by Mr. Neele as pioneers in adopting separate luggage compartments, Mr. Tomlinson says at page 543 of his book:—

> "Luggage was still (in 1854) carried on the tops of the carriages and, as most of the station platforms were exceedingly low, the work of taking the luggage up and down was a fruitful cause of delay. The luggage was not always securely strapped and then the guards were tempted, in contravention of one of their regulations, to pass over the tops of the carriages when in motion to the great risk of life or limb."

Mr. Neele under the year 1866 (at page 149) deals again with the difficulty of luggage interfering with the carriage lamps and says, in relation to the tunnel incline from Lime Street, Liverpool, to Edgehill:—

> "The lighting of the carriages was a source of trouble, as there was always difficulty in getting the roof-lamps to burn with any degree of brilliance in the short run down the incline, and of old times the strapping of the luggage on to the carriage roofs prevented the lamps being lighted on many occasions. So general was the practice of thus dealing with luggage on the tops of the vehicles that gangs of porters appointed to the duty at Lime Street were called 'Topmen' as a distinction, a name which continued for many years after the roofing of the luggage had disappeared."

The jumble of luggage on the roof, before it had been finally strapped down for the journey, is graphically portrayed in W. G. Frith's famous Paddington picture (1862).

Yours faithfully,
KENNETH BROWN

The Scrap Heap

G.W.R. Correspondence Course

The Great Western Railway recently afforded an opportunity to all its employees of taking a correspondence course on the subject of "The Safe Working of Railways and the Appliances used in connection therewith." No fewer than 1,223 members of the staff have enrolled for the classes, which are about to commence.

* * *

The Red Cross Penny-a-Week Fund has received nearly £250,000 from railway staffs in Great Britain. The totals for the four groups at the end of September were: G.W.R., £30,000; L.M.S.R., £98,500; L.N.E.R., £88,000; and Southern Railway, £25,500. Mining employees have contributed £200,000 to the fund; and these two groups, numbering approximately 700,000, are supporting the Red Cross & St. John in this way to the tune of about £3,500 a week. Many of them have doubled and trebled their weekly contributions.

* * *

Travelling by Points

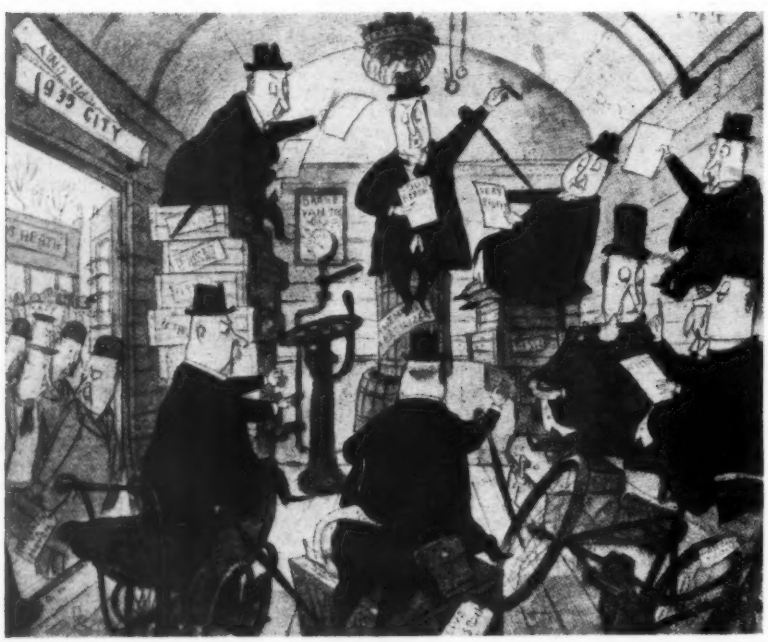
The enemy has started a rumour that travelling in England has been put on a basis of points, and, while there is nothing inherently disastrous or disgraceful in the idea, it would indeed add a further complication to the difficulties of life if in fact it had been adopted. The whole philosophy of points is abstruse, and should it be applied to railway journeys a tariff would have to be drawn up by an expert in the art of divining intentions, for travellers should surely be charged on a basis of motive rather than of mileage. A flat rate on distance covered would be unfair to those whose journeys are really necessary, and, in determining the number of points to be cut out of the neat supplementary books with which we should doubtless be supplied, the authorities would have to turn themselves into a kind of inverted totalisator. A passenger, it might reasonably be inferred without any hurt to local pride, would not undertake a journey to X unless he has some strong business reasons, but the demand for a ticket to Y, that delectable place reached after a change at a junction, a meander through a glorious emptiness of marsh and sky with a view through one window of a destination which suddenly and inexplicably pops up at the other, would, even if there were no golf clubs among the luggage, automatically set the points rocketing. The highest penalties, however, would be reserved for those who apparently love travelling for its own sake and who pursue it with an ardour which seems to increase in proportion to the inconveniences and discomforts involved—a return ticket to Z on a Bank Holiday would cost the enthusiast the whole of his ration at one fell swoop.—*From "The Times."*

* * *

An Early Railway Critic

In an attractive book entitled "Travel in England," Mr. Thomas Burke has a good deal to say about the critics of our first railways. He quotes one of them named "Phoenix" as writing a diatribe to the following effect in 1838:—

"A railway conveyance is a locomotive prison. At a certain period you are compelled to place your person and property in the custody of a set of men exceedingly independent, and who have little regard for your accommodation. Till your journey is accomplished, you are completely subservient to their commands. You pass through the country without much opportunity of contemplating its beauties; you are subjected to the monotonous clatter of its machinery, and every now and then to the unpleasant grating sensation of the brake. To all these things must be added the horribly offensive smells of rancid oil and smoky coal."



"I wish they'd have their Board Meetings when they GET to Town!"

[*Reproduced by permission of the proprietors of "Punch"*

Lion Loose on Southern Railway

Last week a lion in a cage on rail succeeded in getting loose and jumped out of the train. The first news received at

Waterloo was from a Guard who said to a clerk, "Lion out of cage at Clapham." This was passed on by the clerk to his chief as "Line out of gauge at Clapham."

* * *

Morrison Puzzled the Town Clerk

Requests for the use of simple language by Government departments in orders and regulations were renewed in Parliament recently.

Mr. Attlee, Deputy Premier, made this reply to Sir Leonard Lyle (Con., Bournemouth): "As stated by the Home Secretary on May 26, a general guidance has been given to departments on the drafting of subordinate legislation and, in particular, on the importance of securing, as far as possible, that it is intelligible on the face of it, without unnecessary reference to other enactments."

He believed the instructions were being generally observed.

Sir Leonard: May I ask whether you are aware that the Ministry of Home Security recently issued a fire order of approximately 70 pages—with an explanatory memorandum of something like 700 pages—and that it took a certain town clerk on the south coast from 2 to 6 o'clock, with his assistants and the borough auditor, to find out what it all meant?

"Is it not a fact," added Sir Leonard, "that 10,000 orders have been issued since the beginning of the war to these authorities?"

Mr. Attlee said he was not aware, of course, about the town clerk.

Mr. Levy (Con., Elland): Are you aware that these orders are not only issued in the official jargon, which no one can understand, but that, when explanations are asked for from the departments, they reply in the same official jargon? Why issue orders at all if people cannot understand the jargon used?

Mr. Attlee: You are giving this lack of understanding too great universality.—*From "The Star."*

* * *

Tailpiece

(*The need for salvage remains vital.—Ministry of Supply*)

However rich your salvage bag
In metal, paper, bone or rag,
A single piece or rows of it,
Your country can dispose of it.

The need remains, so let them take
Your overplus, and help to make
A bullet, 'plane, or gun of it,
By giving them the run of it.

In time of war the vital stuff
Is seldom plentiful enough.
Your country wants increase of it.
Save every little piece of it!

E. C.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

Hopetoun-Ravensthorpe Railway

In 1909 an isolated section of railway, 34 miles in length, was opened for traffic. The line had been constructed primarily to provide transport between the port at Hopetoun and the goldfields at Ravensthorpe, where the ore contains also silver and copper, and where melting works were operated extensively for many years. Later mining activities declined, and agricultural development took place. At no time, however, did traffic returns reach expectations; and experience with this and other isolated lines taught that the cost of operating a detached line was high in comparison with sections on the main system. The deficit on the Hopetoun-Ravensthorpe line mounted steadily, until at June 30, 1935, it totalled £166,925. (*See map, page* 434).

In 1930 it was decided to close the line, except for wheat and superphosphate traffic, during a period of about three months each year. This restricted service continued for five years, but each year the traffic diminished, and in 1935 it was necessary to keep the line open for a period of seven weeks only. With the passage of the State Transport Co-Ordination Act in 1934, the matter automatically became one for action by the then newly-formed Transport Board. The board made extensive investigations, and reported that it considered that the line should be closed; and it took steps to organise a road-transport service. The railway was closed in 1935. Pending a decision as to the future of the district, most of the rolling stock, including two locomotives, was left at Hopetoun; but, as a result of present needs, this has been transferred to the main system. The transfer was made by road, over a distance of approximately 120 miles, and it is interesting to record that, whereas in 1925 the boiler of one of the locomotives had been transported by horse-drawn vehicle from the main system to Hopetoun in seven days at a cost of £100; its return trip in 1943 was made by motor trailer in seven hours at a cost of £21.

UNITED STATES

Centralised Traffic-Control

The installation of centralised traffic-control proceeds apace, and demands for equipment are being approved by the War Production Board as an expedient requiring far less materials and labour than the doubling of tracks which otherwise might be essential to handle the greatly increased traffic. The latest order, placed with the Union Switch & Signal Company, is for the Western Pacific Railroad, to cover 118 miles of single track through the famous Feather River Canyon, between Oroville and Portola, California. The control machine will be located centrally at Keddie, and coded track-circuits will be installed throughout, arranged on a reversible basis to permit directional control of the system. Searchlight high- and dwarf-signals will be used. Installation work on the site will be carried out by the railway company's staff.

A Remarkable Railway Load

A remarkable feat of railway transport, carried out recently by the Chicago Outer Belt Line of the Chicago, Joliet & Eastern Railroad, has saved a delay of six months in production at a plant producing armour plate for tanks. It became necessary to move an electric stator, of 28 ft. dia., together with its rotor, from one plant to another, two miles away. Complete dismantling for transport and re-assembly, it is estimated, would have taken at least six months. The railway therefore took on the job, and was fortunate in that, on the route concerned, there are no overline structures. Truck assemblies of the heaviest type of hot-metal ladles used in steelworks were prepared to support the load, which was carried vertically; the lowest part of the circular stator-rim travelled at just above track level, and the whole was supported by heavy blocking on eight-wheel trucks at each side, and was held in position laterally by heavy rolled-steel beams which also rested on the truck assemblies. To steady the load (which was supported at a point well below its centre) on curves, travelling cranes were used to give further support to the upper portion, both fore and aft. The stator weighs 101 tons, and the rotor, which travelled as a separate consignment, although of smaller diameter, is heavier, for it weighs 131 tons; in the latter case the method of support was by blocking up the shaft. Both consignments were handled without a hitch.

New Construction and Extensions

The Chesapeake & Ohio Railway is to spend over a million dollars on improvements. Additional interchange facilities at Richmond, Virginia, will cost $205,000; five additional tracks in the classification yard and an extension of five tracks in the receiving yard at Russell, Kentucky, are estimated to cost $745,000; and an extension of the yard lead at Peru, Indiana, is to cost $56,500.

At Shenango, Pennsylvania, where the Erie and Bessemer & Lake Erie Railroads interchange traffic, the former has obtained sanction from the Pennsylvania Public Utility Commission to construct a level rail-crossing over the main line of the latter, at a cost of $41,300.

The Pennsylvania Railroad has recently begun an improvement programme estimated to cost $3,500,000. This includes a new double track, 8 miles long, from 2 miles east of Pierron to 1 mile east of Smithboro, Illinois; a new 540-ft. bridge over Little Shoal Creek, between Pocahontas and Stubblefield, Illinois; and a number of siding additions and extensions and grade separation projects.

The Atlantic Coast Line is building a new 3-storey office building at Wilmington, North Carolina, costing $225,000.

ARGENTINA

Grain as Fuel

An Argentine Government Decree, issued through the Ministry of Agriculture, authorises the Grain Regulating Board to undertake the manufacture of linseed oil for fuel, using for this purpose 500,000 tons of the surplus stock of this cereal. The oil produced will be handed over to the National Oilfields Department for sale to consumers at 310 pesos a ton, placed on wagon in Buenos Aires.

The Grain Regulating Board is authorised also to sell to the National Oilfields Department up to 2,000,000 tons of old wheat, as fuel, at 45 pesos a ton in bulk delivered at any consuming centre in the country, provided delivery is taken before December 31, 1943. The proportion of linseed oil to be used in connection with the quotas of fuel oil and diesel oil is fixed at 20 per cent.

The Grain Regulating Board is authorised further to sell up to 500,000 tons of wheat as fodder, subject to the precaution that the grain thus disposed of is not put to any other use.

Surpluses Exhausted

The preamble to the Government Decree states that the maize surplus has been exhausted, and that the reserve stocks of linseed are being depleted rapidly by their use as fuel. Consequently, it has been found necessary to use the available surplus of old wheat as offering the only solution to the problem created by the fuel shortage throughout the country. It is pointed out that it has become necessary to restrict the export of linseed to reserve the available stock.

The basic prices for wheat and linseed fixed by the Decree dated December 31, 1942, have been cancelled. In view of the reduced maize-stocks, a Decree prohibiting the export of this cereal was issued on August 6, 1943.

The use of wheat and linseed as fuel has resulted in a substantial reduction in the surplus stocks of both these grains, which, after deducting the tonnage allocated for fuel and fodder, were officially estimated at the end of July at 3,860,139 tons and 906,324 tons, respectively.

Allocation of Rolling Stock

The National Railway Board is to give preference in the allocation of rolling stock to wheat and linseed consignments required as fuel in factories and by the public services. Certificates stating that the cereals are to be used for these purposes will be issued by the National Oilfields Department. The railway companies have been authorised to give preference to the transport of linseed intended for the manufacture of linseed oil for fuel.

Railway Unions

Because of the unsatisfactory relations between the committees of the Union Ferroviaria and La Fraternidad, the Argentine Government has issued a Decree ordering an investigation into the affairs of both these unions. The reason given for this step is that for some years the governing authorities have been acting in an arbitrary manner and have not really defended the interests of the railway workers. It is stated that strikes frequently have been ordered without justification, and that the tactics known as "working to rules" have been resorted to on the slightest pretext. On a number of occasions, when partial strikes have been declared by the members, the unions have disclaimed all responsibility, and have alleged that the strikes had been ordered without their knowledge or approval. Their appeals to the members to return to work were unsuccessful, and demonstrated that they neither represented the rank and file nor had control over their actions.

It is stated also that the unions are divided into factions, and that each party claims that the last elections were fraudulent and that illegal pressure was brought to bear on the members in connection with the elections of representatives on the Pension Fund Board. The Government therefore has resolved to take over the archives and records of both unions; after a reorganisation of their internal affairs has been carried out, elections of officers will be held within

a period of four months, in accordance with the statutes of both bodies.

BRAZIL

Inter-Railway Agreements

An arrangement has been made between the Central Brazil Railway and the Leopoldina Railway for reciprocal through-working of rolling stock.

The Central Brazil Railway has come to an agreement with a road-transport affiliate of the Paulista Railway whereby door-to-door deliveries may be effected between the federal capital and the chief cities in the interiors of the states of São Paulo, Minas Geraes, Rio de Janeiro, and Espirito Santo.

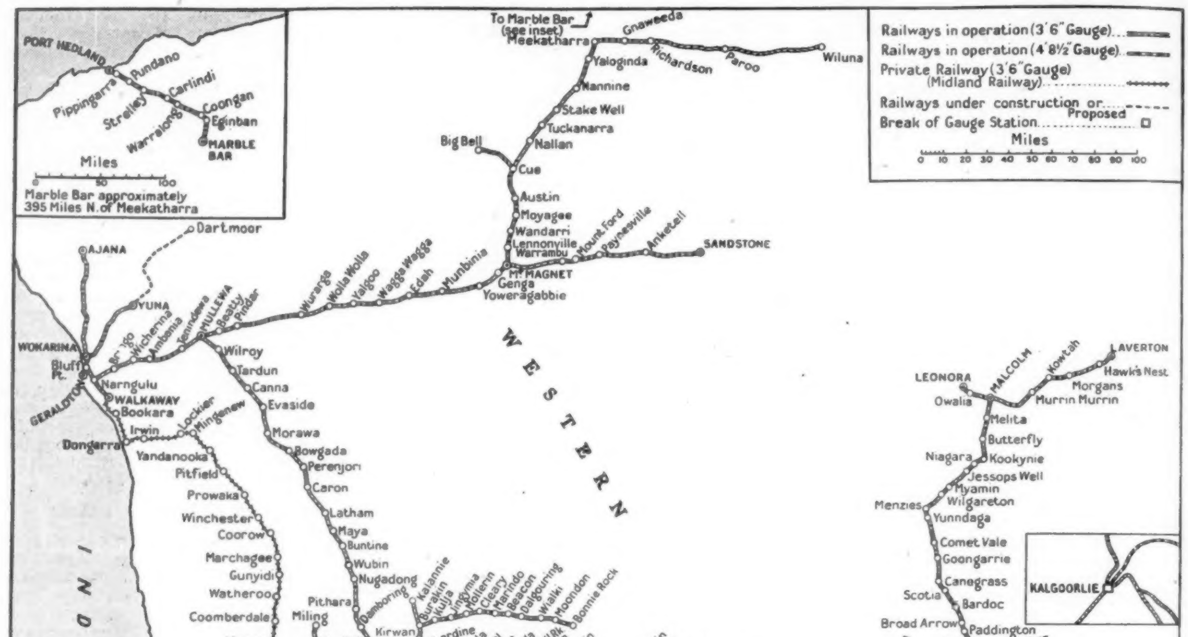
CEYLON

Passengers' Luggage Rates

The Government Railway has introduced a regulation restricting the amount of luggage which a passenger may convey free of charge. Certain articles which formerly were accepted as luggage are now charged for at parcels rates.

Goods Rates

A 10 per cent. increase is to be introduced for all classes of goods. Warehouse rents are to be charged at increased rates after allowing one day's free storage only. Demurrage charges for delay in loading and unloading goods are to be increased also, to speed the turn-round of vehicles.



The railway system of Western Australia. All the lines are owned by the Western Australian Government, excepting the private Midland Railway (separately indicated) between Perth and Walkaway (south of Geraldton), and the standard-gauge Trans-Australian (Commonwealth) Railway from Kalgoorlie to the east

"Remember the Past and Look to the Future"

Abstract of the Presidential Address to the Institution of Mechanical Engineers delivered on Friday, October 22,

by Professor F. C. LEA, O.B.E., D.Sc., Wh.Sc., M.I.Mech.E.

LOUIS PASTEUR, the great French scientist and patriot, once recommended an audience in Edinburgh to "Remember the past and look to the future." I have chosen these simple and striking words as the title of my address because they give me an opportunity of dealing with some of the activities and interests of the last fifty years, and of suggesting what appears to be their significance for the future. As more than half my working life has been spent in close association with young men, it is natural that I should be inclined to address myself chiefly to the younger members of the Institution, for upon them will fall the responsibilities, the successes, and failures of mechanical engineering in this country.

Engineering Fifty Years Ago

Fifty years ago the petrol engine and the high-compression oil engine were hardly out of the experimental stage; the motor car, as we know it today, had not yet come into existence; no heavier-than-air machine had yet risen from the ground, no electric locomotive had been constructed, and although electric trams worked by accumulators had been tried, the only tramcars in effective operation were worked by horses, steam power or cables. It was only a year before I entered the workshop that Parsons produced his first turbine, and it was not until 1890 that the turbo-generator went into service in any power station. The overall efficiency of power stations before the introduction of the turbines was deplorably low. Mr. Bryan Donkin, in his Presidential Address to the Institution of Civil Engineers in 1937 gave the figure for 1891 as 2·5 per cent., whereas in large modern plants it now reaches more than 30 per cent.

The great changes brought about during the last fifty years in the materials available for the mechanical engineer may be said to be of fourfold importance:—

(1) Alloys, ferrous and non-ferrous, have played an important part in the development of turbines, dynamos, alternators, and internal-combustion engines, and have made possible considerable increases in the peripheral speed of rotating masses. Developments of the motorcar and aeroplane engine and aircraft structures have been greatly helped by the non-ferrous alloys having aluminium or magnesium as their principal constituents, which were unknown fifty years ago.

(2) Alloys to resist abrasion, corrosion, and erosion at ordinary and high temperatures have been of great assistance in many industrial processes and have contributed in no small measure to the extraordinary increase in thermal efficiency in modern power plants. The gas turbine has passed beyond the experimental stage and its future success will largely depend upon metals able to withstand high temperatures and stresses.

(3) Improvements in cutting tools have produced a revolution in workshop practice, upon which modern machining processes depend.

(4) The new alloys having special magnetic properties, though not of direct interest to the mechanical engineer, are undoubtedly important to him.

The far-sighted policy of this Institution in establishing the Alloys Research Committee in 1890, and in making possible by its grants the brilliant research work of Sir William Roberts-Austen, has been of very great importance. Rapid progress was made during the last ten years of the nineteenth century in alloying various elements with iron. In 1900, steel for projectiles containing 3 per cent. of chromium was made in the open-hearth furnace. Sir Robert (then Mr.) Hadfield made steels containing 7-21 per cent. of manganese which have prolonged to a remarkable degree the life of dredger-buckets, points, and crossings, and other articles subject to abrasion. These steels, which to-day generally contain 12-14 per cent. of manganese, are quite different from the carbon and many other alloy steels when quenched from a high temperature. Taylor and White in America carried out their classical experiments on the effect of increasing the tungsten and chromium, from which modern high-speed steels have been developed. The introduction of such steels brought about radical improvements in the design and strength of machine tools. It also encouraged research to determine the best form of cutting tools, work in which the institution has helped by the labours of its Cutting Tools Research Committee.

The use of higher working temperatures has brought into prominence the phenomenon of "creep" which has come to be recognised as a controlling factor in the design of many articles. The first research at which I assisted more than forty years ago, was suggested by the failure of some bronze stays in a locomotive boiler. At ordinary temperatures the material was stronger than mild steel and appeared in every way suitable. But, before its use, no tests at elevated temperatures had been made, and it was not suspected that at the working temperature of the stays quite low stresses would cause them to creep sufficiently to bring about the failure of the crown of the firebox.

Non-Destructive Tests of Materials

The development of non-destructive workshop tests has been encouraged of recent years by the need for very careful heat treatment of ferrous alloys, and the risk of hair-line cracks produced either by rapid cooling or during forging. Internal examination of metals by X-rays and radium emanations is of considerable commercial importance. By the use of X-rays those extraordinary changes which metals and alloys undergo as they pass through changes of temperature, or their compositions are varied, are more readily examined than by older methods.

In the early days of the last war a number of light alloys were suggested for aeroplane pistons, but some of these, although excellent for castings, were unsuitable for pistons. The investigation of the effect of temperature on the tensile properties of these metals revealed the reason. Researches at the National Physical Laboratory, in the makers' works, and in my laboratory at Birmingham, led to the use of alloys which were not only sufficiently rigid at the working temperature but could be cast in thousands without any difficulty. In time of war, production was more important than perfection. Then the development at the National Physical Laboratory of the well-known "Y" alloy, which could be forged at suitable temperatures and heat-treated to give a tensile strength approximating to that of mild steel, materially assisted progress, and advances in machine tool practice made it economically possible to machine pistons from the solid forging.

Mechanical Engineering as a Scientific Profession

British engineering can only maintain its place in the world of peace by bringing to the solution of its problems all the aids that science and the scientific method can give. Theory and sound practice are not two distinct aspects of engineering, but, rightly understood, are complementary.

If this is true, engineering requires in its ranks a considerable number of men thoroughly trained theoretically and experimentally in the fundamental principles of physics, mathematics, and other sciences. It is not possible to divorce the various branches of engineering from each other.

The problem of training the youth of the engineering industry already employed in the shops or drawing offices has been partly met by courses arranged in the evening, and by part-time day technical schools and colleges. Part-time day courses for engineering students should be available not only from the ages of 15-18, but also for selected students in subsequent years. This Institution has done a great deal during the last twenty years to improve the standard of part-time engineering education.

It would be of great value to engineering in this country if men who had proved themselves by ability and character were liberated from industry for two or three years, so that, in the technical colleges and universities they could pursue courses not simply leading to further examination results, but partly cultural, partly scientific and technical, which would give opportunity for further development of their intellectual powers and individuality. Training in methods of research should form part of the course for some of these students. A generous scheme of financial encouragement would be necessary, and the results would more than repay the expenditure.

After many years of training students and watching with great interest their future careers, I suggest that the most worthwhile work done in the engineering schools is that which sends out into industry men with much more than an ordinary degree. The opportunity, in the post-pass-degree course, for the student to think for himself, and to absorb completely what he has been taught in the earlier years, and to make this knowledge a part of his individuality, ensures to industry a type of man who can face new problems with confidence.

I am conscious that emphasis has been placed on knowledge, and on scientific and technical training. Only one brief reference has been made to character, and none to one of the most important of all engineering problems—I was going to say, that of controlling other men, but I would rather say, that of working in co-operation with them. In training both workers and staff, we must keep in view more than skill and technical efficiency. These must be supplemented by common sense, sympathy, and judgment, all human qualities that can be fully developed only by a wider culture than science and technology can give, and which can be greatly helped by that contact which is possible in the free give-and-take atmosphere of this great Institution.

Remote Control of Power Locking Frames on the London Underground

Levers in power locking frames are moved by compressed-air cylinders under the control of a signalman in another signal box

AS briefly explained in our issue for September 10, 1943, page 268, the London Passenger Transport Board, on September 8, brought into use its first remotely-controlled power locking frame. Had the war not occurred, the new system of working would have been brought into service some time ago at Shoreditch on the Central Line, and most probably elsewhere also. The necessity for making recently some alterations at a station on another line afforded an opportunity of an immediate practical trial on a small scale, as shown in Fig. 1, and it was accordingly decided to proceed with the work at that point. The installation on the Central Line, although complete as far as the signal box at the remotely-controlled location is concerned, is not yet finished.

The L.P.T.B. had already made use of relay-interlocking equipment, although worked from power frames instead of panels, in its signal boxes of the route-setting type, of which some half dozen are in service. In the case of the largest two additional signal boxes at the ends of the area concerned were provided, with their lever frames normally out of service, the principal signal box then directing traffic throughout the entire area. These boxes can be switched in and worked locally, should this become necessary, as for example when the control circuits between it and the central signal box develop a fault, or the traffic conditions make it desirable to have an official to deal with them on the spot. The circuits required to accomplish this are necessarily somewhat complicated and it is not always a simple matter to find a fault. Delays have at time been experienced through this and the results of even a short delay are very serious on lines carrying the dense train services run by the L.P.T.B. In addition, it was thought undesirable to instal in future large signal boxes controlling everything in their areas by direct circuits of the conventional type. Fire or other forms of damage may have far-reaching effects on an installation of this kind, and when alterations have to be made extensive testing on completion is necessary, to eliminate all possible risk of work on one part of the equipment having inadvertently affected another part, not actually connected with the changes. Practically all the circuits must be classed as vital and only the highest quality of cables or relays can be used for them. The cost of such equipment therefore is appreciable. If, however, several smaller signal boxes are provided, the cost of cabling can be reduced and the effects of damage restricted to a smaller area. Alterations and tests are also more rapidly carried out, but each box requires manning and the operating costs are correspondingly increased. The board accordingly sought to combine the advantages of dispersed equipment with those of the ordinary individual lever type power frame, and to apply at the same time remote control, enabling one signalman, placed at the most convenient point, to work all the levers in a given area as easily as if they were under his immediate observation.

The locking frame in each signal box, as seen in our first illustration, is of the type generally used of late years by the L.P.T.B., with mechanical interlocking. There are, however, no catch handles, a ball registering device replacing them. Near the bottom of the usual vertical shafts geared to the levers, which actuate the mechanical interlocking, are fixed rockers having rollers at their ends, against which press the pistons of small air cylinders, controlled by electro-pneumatic valves, as illustrated in Fig. 2. These pistons are thus able to throw the levers from one position to the other, subject, of course, to any mechanical and electrical locking that may be applied to them. The circuits to the lineside equipment controlled by the levers are of standard type and have no special features. By turning a 3-way cock the air supply is cut off and the cylinders vented to atmosphere; the levers can then be operated by hand, as if the remote control attachments were non-existent. No special electrical switching arrangements are required for changing from remote to local, or local to remote control. The apparatus at the controlling point would usually consist of thumb-switches on a "panel," but if it is more convenient to use some levers in an existing power frame, as was the case in the installation under review, this is easily arranged. Similarly, the controls themselves can be of the individual or the route-setting type; the latter are generally preferred. Suitable circuit arrangements then ensure that

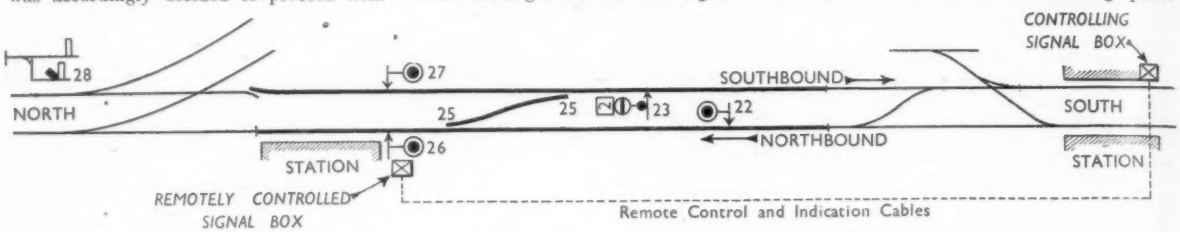


Fig. 1—Diagram of remotely-controlled power frame installation

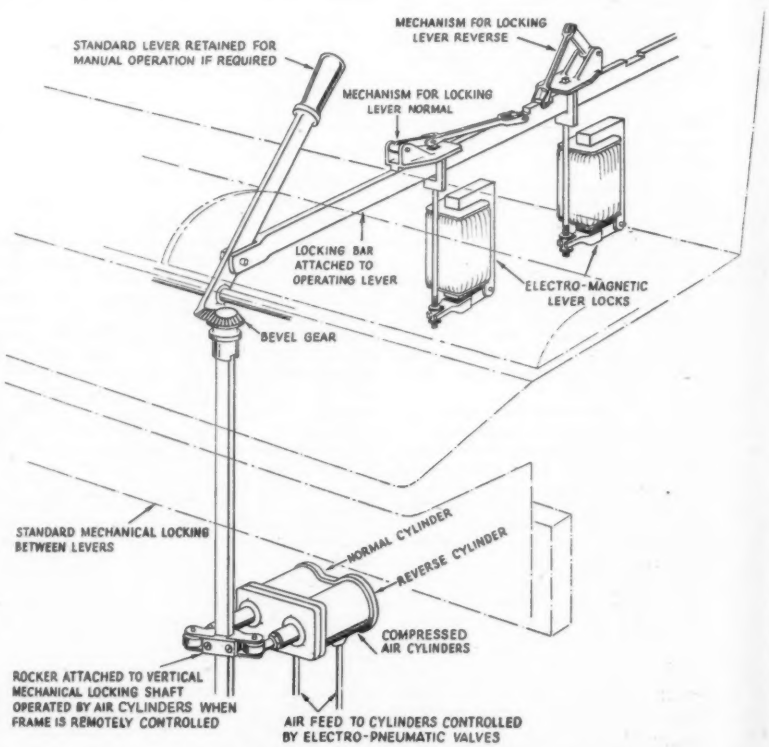
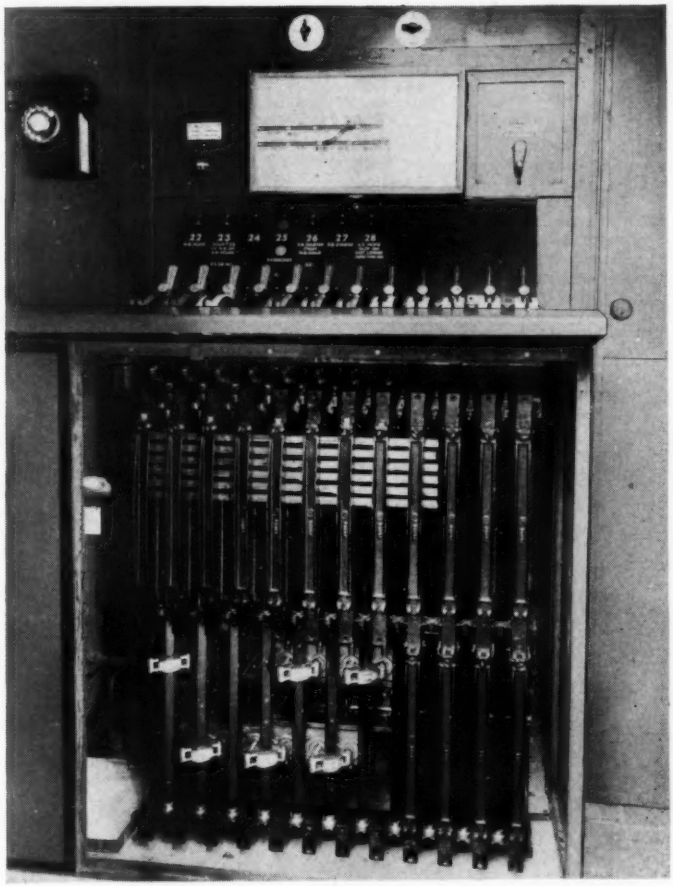


Fig. 2—Application of equipment to lever frame



Power locking frame, showing remote control cylinders on six of the levers

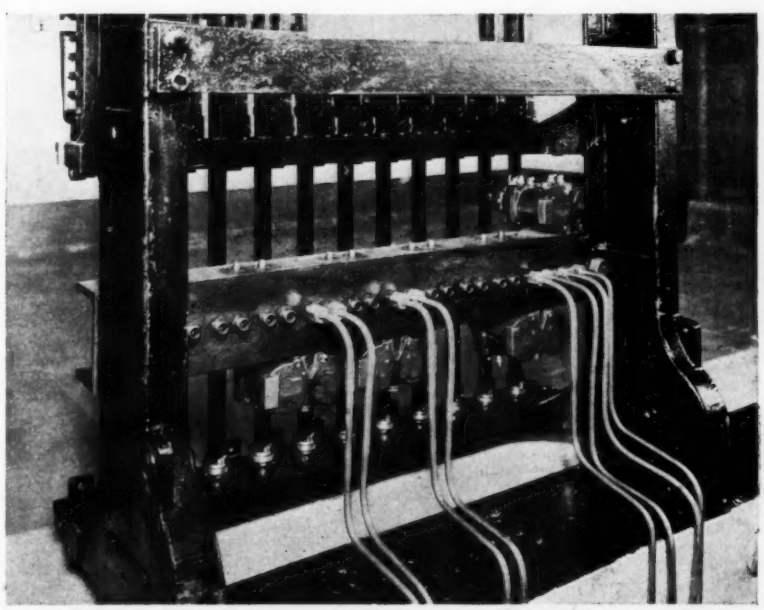
the levers are actuated in the sequence called for by the interlocking. The only alteration of consequence needing to be made in the locking frame itself is the addition of toggle attachments to the electric locks to prevent binding of the latches under the pressure exerted by the air pistons; the thrust of the latter is taken by a roller at the end of a toggle arm lying just off centre and discharged by the energisation of the lock. Should the toggle attachment fail in any way the ordinary notch in the tappet bar, which is still provided, would engage with the latch and effectually stop any false movement of the lever.

Operation and Safety Signalling Circuits

The system recognises a clear distinction between control circuits, which serve to convey the intentions of the signalman to an outlying location or to indicate back to him the position obtaining there, and safety signalling circuits, which effect the safe performance of the actual signalling operations at the location. For the latter high quality cables and relays are used; but for the former the cheaper telephone type material is used, with relays grouped and mounted on racks on the jack-in system. The safety of working being completely independent of the operation circuits, the use of such material presents no objection. The space occupied by the relays is so small that little or no difficulty should be experienced in applying the system to existing signal boxes, their relay rooms usually having sufficient accommodation. The clear separation of the two types of circuits facilitates the rapid diagnosis of faults, as inspection of the positions of the levers in the frame shows at once in which group of circuits the failure is to be looked for.

It is not always necessary to include every lever at an outlying location when applying the remote-control system. Crossovers or connections used only on special occasions, or in single-line working, when a traffic official must be present, may be left to be controlled solely by hand. As the system can be added without difficulty to most of the power frames, except the very oldest, in service on the L.P.T.B. lines and several locations offer favourable opportunities for applying it, it is expected that the new apparatus will find extended adoption in due course, as new works and alterations become necessary. It was designed under the direction of the board's Signal Engineer, Mr. R. Dell.

Although air cylinders are used in the apparatus under review, it would be possible to employ other means of moving the levers, such as solenoids, should this prove more convenient at any particular location. It would also not be difficult to apply the principles of the system to other types of power frame and construct suitable equipment. Automatic movement of levers has been known for some years in the all-pneumatic power system, both for indication purposes, with stroke completer mechanism, and track circuit replacement of signals, the train acting on the signal through the lever, which is restored to the indication position independently of the signalman when the track relay releases. The signal is returned to danger by power and the return indication from it causes air to be applied to the stroke completer. Electrical stroke completer apparatus has also been used for similar purposes.



Air cylinders mounted behind locking shafts and pipes to e.p. control valves

New Type of L.M.S.R. "Railbar"

Pre-fabricated units are used, which can be loaded into one container and erected in one day

TO enable the greatly-increased number of passengers now travelling to obtain snacks to take with them on trains, the railways have made provision for additional serving-counter facilities. On the L.M.S.R. these facilities are provided by "railbars."

As was stated in our issue of September 17, two types of "railbar" have been introduced by the L.M.S.R.; the first was installed at Euston last January, and is a permanent structure, located on the site of previous refreshment rooms, with an open counter capable of dealing with a larger number of persons than the usual room. This "railbar," which was described and illustrated in our issues of January 22 and January 29, has been visited by about one million customers.

"Railbars" of the second type, to be installed at provincial centres, are standardised-unit buildings. They will be placed on platforms so that, with existing refreshment rooms, they create points along the lengths of trains at which tea and light refreshments can be obtained, and so eliminate crowding. The first is to be opened at Crewe, and others will be installed at Preston, Derby, Sheffield, and Rugby (at other principal stations existing buildings are being adapted to the "railbar" principle).

The second type of "railbar" called for a special class of building. In the first place, it had to be planned so that everything should be to hand to allow serving to be carried out with a minimum of staff. Secondly, units were needed capable of rapid erection on the site, to eliminate interference with railway working. There were also constructional problems to be faced, arising from the need for strict economy in the use of building materials.

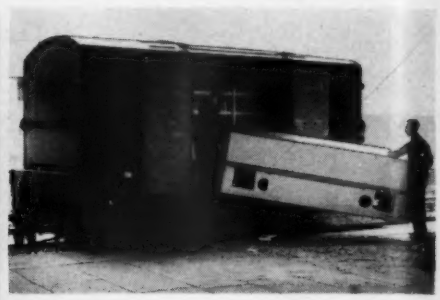
The design adopted suits all these requirements. The standard-unit "railbars" are pre-fabricated, down to the inclusion of plumbing, lighting, and paint finish. The only work required on the site is the running of services and drainage to a point adjacent to the "railbar." This work is carried out before the "railbar" itself is delivered.

To facilitate transport, the "railbar" will be brought to the site in sections as follows:—(1) pre-cast concrete floor-units; (2) back section, consisting of shelving; (3) front section, consisting of counter, cash drawers, and other items; (4) two end sections, one consisting of door and frame, and the other of a panel containing the plumbing, sink, and other components; (5) roof section, containing the lighting equipment and the ventilation hood for the hot-water boiler. The structure can be loaded into one container and it is estimated that the erection, and connecting up with drains, should take one day.

The Ministry of Works & Planning has agreed that plywood be released for these buildings; this allows the units to be extremely light. Every advantage has been taken of economy in the general design. The normal studding which acts as a framing for walls is eliminated, and in the back unit the shelves act as a stiffening for the external wall facing. The design everywhere conforms to, or shows an improvement on, the Ministry's recommendations for the conservation of materials.

There has been an extensive use of pre-fabricated units in this country during the war, but the "railbars" are probably the first examples of these which contain equipment such as plumbing and lighting apparatus, and for the construction of which work on the site involves nothing more than bolting together the parts.

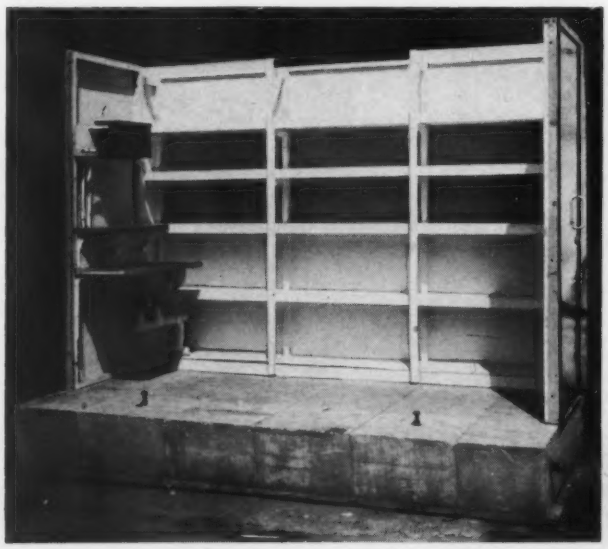
The "railbars" are under the direction of Mr. Arthur Towle, Controller, L.M.S.R. Hotel Services. The design of the buildings is the work of Mr. W. H. Hamlyn, Architect, L.M.S.R., and his staff; and the contractor is Holliday & Greenwood Limited, of London.



Units of a "railbar"

(Above) being unloaded at destination

(Left) being loaded into a container



A "railbar" in course of erection

Complete "railbar" unit

RAILWAY NEWS SECTION

PERSONAL

The King has recently awarded the Imperial Service Medal to five employees of the New South Wales Department of Road Transport & Tramways and to ten employees of the New South Wales Department of Railways.

Mr. J. H. Gibb, Acting Revenue Accountant, South African Railways & Harbours, retired on August 1, after 41 years' service with that system and the former Cape Government Railways.

We regret to record the death on October 19, in his 83rd year, of Mr. John Taylor Jones, who was Divisional Solicitor, Manchester, L.M.S.R., 1923-25, and was previously Assistant Solicitor, Lancashire & Yorkshire Railway.

At a meeting of the General Managers' Conference held in the Irish Railway Clearing House, Dublin, on October 19, Mr. S. C. Little, General Manager, Sligo, Leitrim & Northern Counties Railway, was elected Chairman of the conference for 1944.

Captain A. R. S. Nutting, O.B.E., M.C., and Air-Commodore Harald Peake have been elected Directors of the Westinghouse Brake & Signal Co. Ltd.

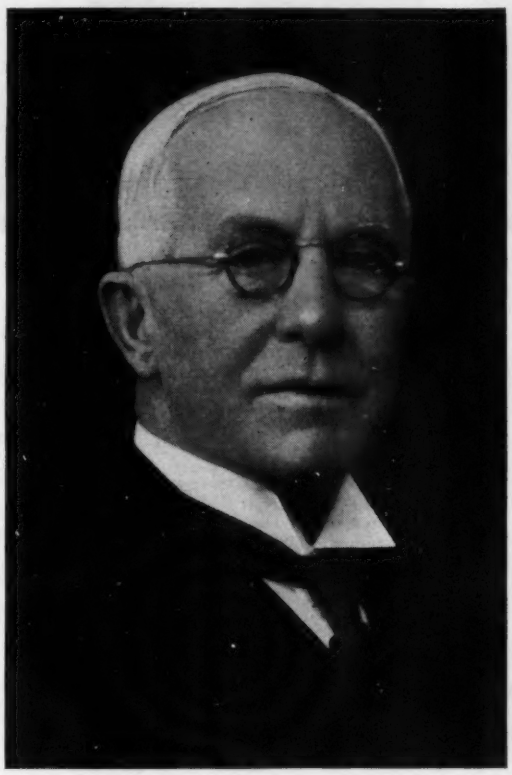
The Federation of British Rubber & Allied Manufacturers' Associations has appointed Mr. Frederick Wills to be its Solicitor & Secretary. Mr. Wills was engaged for a time in the Parliamentary work of the London & North Eastern Railway Company, from the service of which he resigned in 1934.

Mr. Charles Bullock has been appointed Sales Director of Brush Coachwork Limited, Loughborough. He joins that company from Boulton Paul Aircraft Limited, before which he was attached to the Ministry of Supply. He was previously for several years Western General Manager & National Sales Promotion Manager of Parke Austin & Lipscomb Incorporated, of New York, U.S.A.

MEMORIAL SERVICE FOR MR. O. C. POWER

A memorial service for Mr. O. C. Power, Director & Traffic Manager, Birmingham & Midland Motor Omnibus Co. Ltd., who died on October 14, was held at St. Martin's, Bull Ring, Birmingham, on October 19. Among those who attended were :—

Mr. C. Rayner-Smith, Assistant Divisional Superintendent, Birmingham, Great Western Railway (also representing Sir James Milne, General Manager, Mr. Gilbert Matthews, Superintendent of the Line, and Mr. A. V. R. Brown, Divisional Superintendent, Birmingham, G.W.R.); Mr. J. B. Dunkley, District Passenger Manager, Birmingham, L.M.S.R. (also representing the L.M.S.R. and the chief officers at headquarters); and Messrs. G. Cardwell and F. P. Arnold, Thomas Tilling Limited (the former also representing Sir Frederick Heaton, Chairman & Managing Director, who was absent in Northern Ireland).



Professor F. C. Lea

President, Institution of Mechanical Engineers

Professor F. C. Lea, O.B.E., D.Sc., M.Inst.C.E., M.I.Mech.E., Wh.Sc., A.R.C.S., who is President of the Institution of Mechanical Engineers for 1943-44, served an apprenticeship with the former London & North Western Railway at Crewe, on the completion of which he became a student at the University of Manchester and Manchester Technical College, and later at the Royal College of Science, London, of which he obtained the distinction of being a double first class associate. He was the Senior Whitworth Scholar in 1896. After obtaining experience in the manufacture and installation of various types of plant, electrical and mechanical, he became an assistant in the Civil Engineering Department, L.N.W.R.; subsequently he was appointed Chief Assistant to Professor W. C. Unwin, City & Guilds Engineering College, during his tenure of which office he was awarded the Telford Premium of the Institution of Civil Engineers. He left to take a Government appointment, and two years later became Professor of Civil Engineering, University of Birmingham. He was President of the Birmingham & District Branch of the Institution of Civil Engineers. During the war of 1914-19 he held a Territorial commission, and subsequently commissions in the R.N.V.R., R.F.C., and R.A.F.; his work was concerned principally with aircraft research. Dr. Lea was Dean of the Faculty of Engineering, University of Sheffield, from 1925 to 1936, and on his retirement became a Director of Edgar Allen & Co. Ltd. He has been Chairman of the Yorkshire Branches of the Institution of Mechanical Engineers and Institution of Civil Engineers, and has served for a number of years on the Council, and since 1939 as a Vice-President, of the Institution of Mechanical Engineers.

MEMORIAL SERVICE FOR SIR GUY GRANET

A memorial service for Sir Guy Granet was held on October 20 at St. Michael's, Cornhill. Among those present, in addition to family mourners, were :—

Lt.-Colonel the Hon. J. J. Astor, Director, Great Western Railway Company, and Chairman, Times Publishing Co. Ltd.; Sir Thomas Royden, Chairman, London Midland & Scottish Railway Company; Sir William Wood, President, L.M.S.R. (also representing Sir Alan Anderson, Controller of Railways, Ministry of War Transport); Sir Francis Joseph, Director, and Mr. G. R. Smith, Secretary (also representing Sir Samuel Beale and Colonel Sir Ralph Glyn, Directors), London Midland & Scottish Railway Company; Messrs. A. Eddy, Chief Legal Adviser & Solicitor, A. E. Towle, Controller of Hotel Services, and H. V. Mosley, Chief Executive Officer for New Works & Parliamentary Business, L.M.S.R.; Lt.-Colonel F. A. Cortez-Leigh, formerly Chief Electrical Engineer, L.M.S.R.; Sir Felix Pole, Chairman, Associated Electrical Industries Limited; Mr. R. H. Haviland, Associated Electrical Industries Limited, Director, Electrical Manufacturers Finance Co. Ltd.; Lord Wardington, Chairman, Sir Francis Beane, Vice-Chairman, and Mr. S. Parkes, Director & Chief General Manager, Lloyds Bank Limited; Mr. O. H. Smith, Chairman, Provident Mutual Life Assurance Association; Lord Ashfield, Chairman, and Messrs. P. Ashley Cooper, member, and C. G. Page, Secretary & Chief Legal Adviser, L.P.T.B.; Colonel E. Gore-Browne, Deputy-Chairman, Southern Railway Company; Sir Edward Peacock, Director, Canadian Pacific Railway Company; Sir Lynden Macassey; Messrs. O. R. H. Bury, Director, London & North Eastern Railway Company, and Chairman & Managing Director, Peruvian Corporation Limited; W. K. Whigham, Director, London & North Eastern Railway Company, and Central Argentine Railway Limited; V. M. Barrington-Ward, Assistant General Manager (Operating), L.N.E.R.; Brig.-General Sir Osborne Mance, Director of Inland Waterways, Ministry of War Transport; Messrs. C. H. Pearson, Chairman, Leopoldina Railway Co. Ltd., Taltal Railway Co. Ltd., and Great Southern of Spain Railway Co. Ltd., and Director, Central Argentine Railway Limited; A. Vernon Smith, Leopoldina Railway; W. Howard-Williams, Chairman, Central Argentine Railway Limited, Deputy-Chairman, Buenos Ayres & Pacific Railway Co. Ltd., and Director, United Railways of the Havana & Regla Warehouses Limited; R. Leslie, Director, A. S. Matthews, Secretary, and G. Cocollis, Chief Accountant (London) & Assistant Secretary, Central Argentine Railway Limited; Lt.-Colonel Kenneth Speir, Secretary, Transportation Club; Major Robert Grant, U.S.A. Army; and Messrs. T. E. Argile, member, Railway Rates Tribunal; John Quirey, formerly member, Railway Rates Tribunal; C. H. St. J. Hornby; C. E. R. Sherrington, Secretary, Railway Research Service, H. C. Walton, General Secretary, Railway Benevolent Institution; and H. K. Beale and H. Barrs Davies, Beale & Company. Sir Harold Hartley, Vice-President, L.M.S.R., was unavoidably prevented from attending.

Mr. L. C. Brittlebank, District Goods Manager, Wolverhampton, L.M.S.R., who, as recorded in our October 15 issue, has

Mr. L. C. Brittlebank

Appointed District Goods Manager, Birmingham, L.M.S.R.

Mr. F. C. Bishop

Appointed Divisional Superintendent, Southern Division, S.R.

Mr. E. J. Stephens

Appointed District Superintendent, Doncaster, L.N.E.R.

been appointed District Goods Manager, Birmingham, entered the service of the former Lancashire & Yorkshire Railway at Manchester in 1906. After graduating through the various sections of the work of the Goods Department, and serving on shunting, goods-terminal, mechanical-appliances, and other committees, he was transferred to the personal staff of the Chief Goods Manager, where he acted as General Assistant. In 1919, Mr. Brittlebank was selected to take charge of the then newly-formed Motor & Cartage Department of the L.Y.R., and, in addition, assisted in the investigations in connection with the company's application for road powers, and the revision of rates and charges. After the amalgamation, he was transferred to the headquarters staff of the L.M.S.R. at Euston, and was appointed, in 1925, Cartage Assistant to the London District Goods Manager. He was appointed Assistant District Goods Manager, Broad Street, in 1930, and became District Goods & Passenger Manager, Chester, in 1936, during which period he was Chairman of the Government Port Emergency Committee at Holyhead and was also a member of the Regional Transport Committee for the area. Mr. Brittlebank became District Goods Manager, Wolverhampton, in June, 1940.

Mr. F. C. Bishop, M.Inst.T., Assistant Divisional Superintendent, London Central Division, Southern Railway, who, as recorded in our October 8 issue, has been appointed Divisional Superintendent, Southern Division, began his career as a junior clerk at Birchington, South Eastern & Chatham Railway, in 1899, and, after experience in all branches of station work there and at Belvedere, was transferred to the office of the Superintendent of the Line in 1903. He served in various sections of that office until 1914, when, on the outbreak of war, he was appointed to the special staff dealing with naval and military movements. After demobilisation, he took part in the remaking of the timetables, and subsequently took charge of the Main Line Section of the Timetable & Train Running Department. He was appointed Chief Clerk to the Eastern Divisional Superintendent in 1924, and six years later became Assistant Southern Divisional Superintendent. Mr. Bishop was appointed Assistant Divisional Superintendent, London Central Division, in September, 1933.

Mr. E. J. Stephens, District Superintendent, Lincoln, L.N.E.R., who, as recorded in our August 20 issue, has been appointed District Superintendent, Doncaster, joined the former North Eastern Railway at York in 1922, and was first employed in the Goods Manager's Office. After eighteen months he was transferred to the Operating Department of the L.N.E.R., where he gained experience at the West Hartlepool Docks and in the York, Darlington, and Hull Districts. Meanwhile Mr. Stephens had been for a time, on the Divisional General Manager's staff at York in connection with the organisation of the railway-centenary celebrations. In 1926 he was transferred to the Southern Area as Assistant Yardmaster, Doncaster, and four years later became Yardmaster at Wath, where he remained until promoted to be Assistant District Superintendent at Doncaster in 1932. He became District Superintendent, Lincoln, in January, 1937. During the war of 1914-19 Mr. Stephens saw service in Palestine with the Special Reserve of the Royal Field Artillery.

Lt.-Commander McKay, R.N.V.R., son-in-law of Sir Frederick Heaton, Chairman of Thomas Tilling Limited and of Short Brothers, has received the D.S.O. for his work on the Russian convoy. His armed trawler rescued 60 men who had been dive-bombed and took them into Archangel.

The department of the Vice-President of Research & Development, Canadian National Railways, has been divided into two branches, with Mr. J. E. Gibault in charge of research, and Mr. M. W. Maxwell in charge of development. Mr. Gibault was previously Assistant Chief of Research & Development, and Mr. Maxwell was Chief Commissioner of Development & Natural Resources, for the system. The work of the department, which was established in 1923 as the Bureau of Economics, is concerned chiefly with studies, in the spheres of economics and research, of the activities of the C.N.R.

Mr. Joseph Harrison, Stationmaster, Euston, L.M.S.R., with his wife and daughter, after being invested with the insignia of a Member of the Order of the British Empire at Buckingham Palace recently

TRANSPORT SERVICES AND THE WAR—213

Christmas Travel

To assist in the reduction of winter travel, arrangements have been made that evacuated Civil Servants will receive no rail passes during the Christmas holiday period, and only two up to March 31 next.

Improved Train Lighting

The G.W.R. has improved the lighting in 26,000 train compartments during the summer.

The Southern Railway has provided its trains with 25,000 shades, and 18,000 electric lamp bulbs, to improve blackout travelling. The changeover has necessitated modifications to the fittings or wiring on more than 4,000 carriages.

Canteens on Rail

Just three years ago, at the end of October, 1940, the first of the long-distance leave trains for troops, carrying a N.A.A.F.I. buffet-car service left London for the North. Before long there were six such leave trains equipped with canteen service, making daily runs from London to the North and South-West and back, totalling 27 trips a month. The buffet-car service rapidly proved enormously popular with the troops, and 500 snack meals on a single run became the order of the day. They consisted of beverages, buns, sandwiches, cakes, pies, sausages, sausage-rolls, cut meats, cheese, baked beans, tomatoes, potatoes, and fruit drinks. In addition, the Servicemen could buy such articles as soap, toothpaste, polishes, cigarettes, tobacco, matches, razor blades, and confectionery, at the buffet-car counter. During the first six months of the buffet-car service the N.A.A.F.I. provided nearly 300,000 snack meals. At the end of the first year it had provided a million-and-a-quarter such snacks. Today, on the third anniversary of N.A.A.F.I. leave train canteens, the figure is between three and four million—not an inconsiderable achievement when it is realised that this service has been maintained by a mere handful of staff. In the early days, the buffet cars were in use on weekdays only, but a Sunday service was inaugurated in June, 1941; however, the six leave trains on which it formerly operated have since been reduced to four.

Every buffet car has been staffed throughout by a crew of four, consisting of a manager, two general assistants, and one cook. The following has been their daily routine: Arrive at the northern terminus about 3 or 4 a.m., and snatch five or six hours of sleep; then wash, have a light breakfast, and cut some six or seven hundred sandwiches, a job occupying most of the morning; by 2 p.m. the staff mid-day meal is over, allowing about three hours additional rest; the train is then shunted into the station and the staff sets the canteen display and prepares for service; this service continues from some time in the evening till early the next morning, the hours of service in the buffet car being determined by the officer-in-charge of troops and controlled by the N.C.Os. under their jurisdiction. The privilege of using the buffet car is restricted to troops on the train. No troops on the railway station may use it, nor, in accordance with the N.A.A.F.I. obligation to serve only members of the Armed Forces, is the service available to railway staff or any other civilians. Members of the N.A.A.F.I. staff wear special badges which give them the authority to travel on the trains, and which are recognised by the railway companies.

During the heat of the summer months, the buffet cars serve iced fruit drinks to the troops. The ice is usable only during the early stages of the journey, because of its short life in the warmth and congestion of the car; but it is found that, as the day wears on, troops abandon fruit drinks in favour of cups of tea. In one recent month four leave-train buffet cars disposed of more than 43,000 cups of tea and nearly 6,000 glasses of lemonade. By reason of the restricted storage space in the buffet car, it is not possible to store large quantities of bottled minerals, and the fruit drinks are therefore prepared from crystals or squashes.

The N.A.A.F.I. Trains Superintendent, with an office on a main London railway station, is Mr. F. N. Murray, who was appointed some fifteen months ago, and who had previously had 25 years of experience of catering on Pullman cars. The ultimate control of the N.A.A.F.I. leave-train service is in the hands of the Home Institutes Service at N.A.A.F.I. headquarters. Staffing and service are organised through the Trains Superintendent and depot and assistant depot managers at key points on the runs of the trains. Brief reference to the inauguration of the facilities (on the L.M.S.R.) was made in our issue of November 22, 1940 (page 548).

London Transport Winter Programme

The winter bus schedules for the Central Area routes of the London Passenger Transport Board came into operation on Wednesday last, October 27. Reduced running times became effective on 155 routes, amounting to a few minutes in each case, but making a substantial total of time saved. This time is being used partly to lengthen the busmen's meal relief, and partly to reduce the length of spells of duty. To allow for the earlier movement of traffic in consequence of the earlier blackout, evening peak services now begin at approximately 4.30 p.m. and continue until 7.30 p.m. when the intervals are widened to 10-15 minutes. The times of last buses remain unchanged at about 10 p.m.

Railways in German-Occupied Russia

According to a report from German sources, the route length of the railway system in German-occupied Russia in July last was 30,000 km. (18,640 miles) in working order. This included some 2,000 km. (1,242 miles) which the Germans had converted to double track. In addition, the permanent way had been renewed or otherwise reconstructed for many thousands of miles. About 1,250 bridges had been repaired, permanently or temporarily. No difficulty is stated to have been encountered in the wholesale conversion of the Russian gauge (5 ft.) to the European standard gauge (4 ft. 8½ in.), and progress in one case is stated to have been at the daily rate of 52 km. (32·3 miles) when a labour force of some 10,000 Russians supervised by only 40 Germans was employed.

Restoring Russian Railways

Russian railwaymen, following close behind the Red Army to restore re-captured railway lines to working order, are making tremendous efforts to keep pace with the advance of the army. In the last fortnight of September nearly 750 miles of track on the central and southern fronts were restored to operation, ready to bring up reinforcements and supplies, according to the Soviet Vice-Commissar for Railways. Many large stations and important junctions are already functioning again. During the last six months some 5,000 miles of track have been restored. The total to date for the whole war in Russia is nearly 10,000 miles of single track, 700 miles of double track, and 1,500 miles of siding and marshalling yard.

French Passenger Train Reductions

Train services in France were curtailed drastically in the early part of October, and on some lines of minor importance there are now only one or two passenger trains a week in each direction. The rumour that passenger train services were to be discontinued altogether in certain occupied areas has not been confirmed. This further step, coming on top of a series of progressive curtailments introduced since France collapsed in 1940, is said to be a result of the intensified requisition of locomotives and rolling stock by the German authorities. The position is particularly acute on the Côte d'Azur, where the railway services are stated to have been severely disorganised since the Italian occupation

A corner of the first buffet car to go into service, exactly three years ago, under the N.A.A.F.I. arrangements for rail canteens for the Forces (see accompanying paragraph)

troops were replaced by other Axis Forces. The French National Railways Company has announced that it may be compelled to withdraw without notice a number of train services between Marseilles and Nice. For some time past, very few trains have been worked between Nice, Monte Carlo, and Mentone. Brief details of the services principally affected by the reductions in the Lyons area, which came into force on October 14, were given in our October 15 issue, page 395.

This wholesale curtailment of train services has proved a heavy blow, particularly to the town populations which are no longer able to make their customary trips into the country to collect food direct from the farmers. The French Red Cross has announced that it is no longer able to arrange return journeys for children it has sent to health resorts or country places, and parents are requested to make their own provision for the railway journey home.

Wagon Control in Switzerland

Shortage of rolling stock in Switzerland has led the authorities to institute a form of control over private owners' wagons, as a precaution against their sale after they have entered another country. Powers to do this were taken early in the war, and now the despatch of any wagon from the country, loaded or empty, has to be authorised, and the owner must undertake to have it brought back into Switzerland within 30 days. Failure to do so is a punishable offence under the export control regulations.

Sabotage in Savoy

In general, the size of the French National Railways system, and the effectiveness of the German control, have prevented French patriots from disorganising the transport systems of their country to an extent comparable with that which has been practised in Jugoslavia, Belgium, and other places. In one particular area, however, a series of well-directed acts of sabotage has achieved a considerable measure of success, and much damage has been wrought in recent weeks to the railway system in Savoy and adjacent districts, namely, the region to the east and south-east of Lyons. This area is of considerable importance in view of its proximity to the Italian frontier, as it provides the only district through which the Germans can readily reinforce their armies in north-west Italy, as the transit of military supplies through Switzerland is barred.

The 24-mile Bellegarde—Annemasse line, to the south of Geneva, has been the object of special attention after having been reopened to through traffic only on August 1 (as recorded in our September 10 issue, page 265). Towards the end of August the line was blown up near Viry Station, 12 miles to the east of Bellegarde, and a three-day suspension of traffic resulted. In the first fortnight of September the rails were torn up by a bomb near Bossey-Veyrier Station, 20 miles to the east of Bellegarde, but the line was reopened to traffic after a delay of a few hours. On September 21 it was reported that near the same station an attempt had been made to blow up a goods train; three wagons were derailed. Two days later the line was again blown up, this time near Valleiry Station, 8 miles to the east of Bellegarde. About the same date an attempt was made against the main-line railway linking Aix-les-Bains with Annecy, La-Roche-sur-Foron, and Annemasse; this was near Evires, between Annecy and La Roche, 14 miles to the north of Annecy. The Bayonne—Toulouse—Annemasse fast train was derailed, and two carriages fell down the embankment. It took a week to restore the line to working order.

Damage to the line, and a derailment, were caused through an explosion near St. Amour Station on the Lyons—Besançon main line in the second half of September. St. Amour is 78 miles to the north-east of Lyons, and is an important junction station. Traffic was disorganised on both the Dijon—Bourg—Chambéry—Modane and the Lyons—Besançon main lines. Almost simultaneously it was reported that a German armoured train had been derailed through a bomb explosion near Chignin-les-Marches Station on the Chambéry—Modane main line, 6 miles to the south-east of Chambéry, disorganising the traffic also on the connecting lines from Chambéry to Lyons, and from St. Pierre d'Albigny (to the east of Chambéry) to Albertville and Bourg-St. Maurice, as well as on the Montmélian—Grenoble main line. In the same region, during the night of September 12-13, the rails were unfastened for a considerable length near Chamousset Station, 19 miles to the east of Chambéry, on the main line to Modane. A week later a viaduct on the Toulon—Nice main line, near Anthéor-Cap-Roux Station, 12 miles to the west of Cannes, was blown up.

It is reported that a large wagon-building works near Grenoble was destroyed by fire on October 17.

The Mont Cenis Tunnel

Although some of the acts of sabotage by French patriots, which we record in the previous note, are obviously concerned with internal disruption, others are part of a concerted plan to interrupt German communications between Germany and Northern Italy. Normally, transit between Germany and Northern Italy is achieved mainly through Switzerland, and by means of the Brenner Pass; the latter provides the only direct contact between the two countries. In view of Swiss neutrality, the main routes *via* Switzerland are barred to military traffic, and the Swiss have made no secret of the fact that the great tunnels, such as the Lötschberg, the Simplon, and the Gotthard, which form essential portions of all the through routes, have been mined, and will be destroyed immediately, should any military attack on Switzerland be launched with the object of forcing a passage. This situation, therefore, adds considerably to the importance, from the German viewpoint, of the two approaches to north-west Italy through France, namely, the Mont Cenis route, and the coastal route. It will be noticed from the details given in the preceding note that the French approach lines to both of these routes have been the subject of attack.

With regard to the Mont Cenis route, which provides the more direct of the two lines of communication, the French patriot efforts were directed first to the disruption of traffic on the Chambéry-Modane Railway, as recorded in the previous note. Then the Italians in northern Italy were stated by the Algiers radio of September 16 to have established an "island of resistance" near the Italian portal of the Mont Cenis tunnel, holding up all southbound traffic. The R.A.F. made its contribution on September 16 by raiding Modane, and it was subsequently stated that the Italians had destroyed a section of the tunnel. Colour was given to this by the unconfirmed report that Germany was bringing considerable pressure to bear on the Swiss Government in order to secure the concession of permission to transport munitions and war supplies from Germany to the Italian battlefronts through Switzerland. It is alleged that the Swiss Government rejected the demand, and that German pressure was lifted on or about September 20. Ten days later, reports came through neutral sources that the Mont Cenis tunnel route was likely to be closed for some 7 to 8 months, as the result of damage to the tunnel. It is not very clear what damage the Italians succeeded in achieving, but it seems likely that the major damage, and that which has caused the entire suspension of traffic through the tunnel, resulted from the efforts of the French patriots. It is understood that an explosion which they arranged caused the tunnel to collapse for a length of some 150 to 200 metres (say 490 to 650 ft.), but other reports have suggested that the extent of the collapse is even more lengthy, and involves about 800 metres (2,625 ft.).

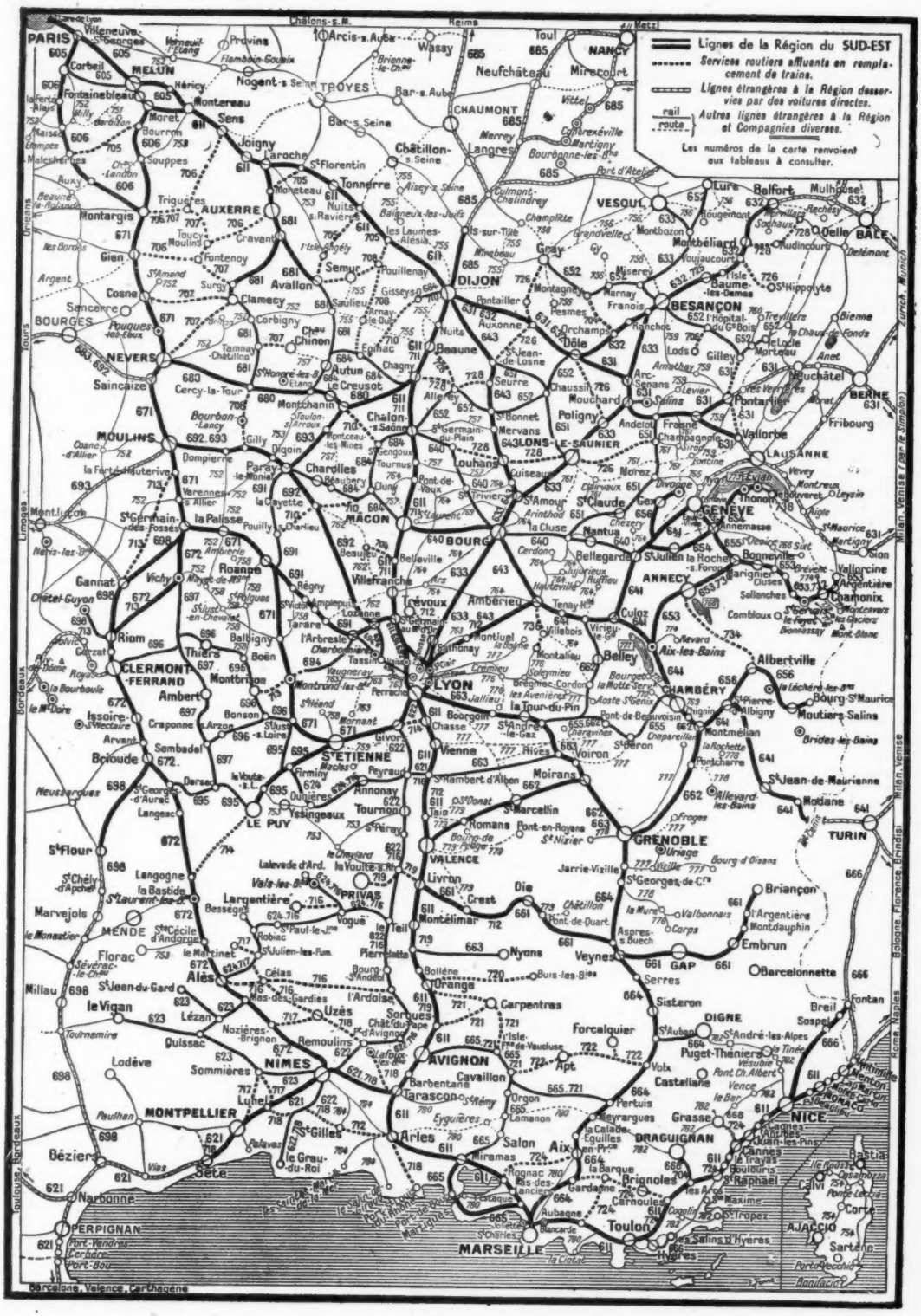
Swiss-Italian Traffic

Ever since the unconditional surrender of the Badoglio Government in Italy, traffic between Switzerland and Northern Italy appears to have been subjected to a series of interruptions, as might be expected in view of the German occupation of Northern Italy. On September 21 the Vichy radio said that a small volume of traffic had begun to pass across the Swiss-Italian frontier on the Chiasso-Milan line, but that it was subject to close control by the German Customs officials, and that strict scrutiny was being exercised over all passengers. A day or two later, the Swiss radio said that all traffic had ceased once more, but it seems to have been resumed a little later, subject to rigid control. On October 3 the German radio said that all passes authorising local crossings of the Swiss-Italian frontier had been cancelled by the German authorities in Northern Italy on the previous day. The radio announcement added that no further trains were being permitted to leave the frontier stations of Chiasso, Brigue, or Gondo for Italy. Since then, there have been no reports of further resumption.

Transport in North-West China

Numbers of Chinese Government reclamation colonies have been established in the fertile but sparsely populated north-west valleys and plains in Shensi and Kansu. Another one at the Tsaidam basin in north-western Chinghai is settled by 30,000 Moslem cavalrymen, who, in the three bitter winter months of 1938, built with their hands and improvised tools the Kansu-Sinkiang Highway, an important stretch of the North-West Highway connecting China with the U.S.S.R. The greatest drawback to development in the north-west is the lack of easy transport. With the exception of an air line between Tihwa and Chungking, *via* Lanchow, a few hundred kilometres of railway, and a few thousand kilometres of highway, the north-west depends on carts and pack animals.

The Chinese Ministry of Communications is expediting the western extension of the Lunghai Railway from Tienshui to Lanchow. The line will be further extended through the Kansu corridor to Sinkiang, with branches to Chinghai and Ningsia. New highways will also be built to connect important cities in the area. One advantage of highway transport is its nearness to oil wells. The Tienshan and Chilienshan ranges contain the two most important oil fields in China. Modern wells are producing petrol in rapidly increasing quantities in Kansu and Sinkiang.



Reproduction of one of the maps in the French "Indicateur Chaix" timetable, showing as dotted lines the closed branches where road transport had replaced rail services at the outbreak of war. The lines to the east and south-east of Lyons have been subjected recently to a series of well-directed acts of sabotage by French patriots (See opposite page)

Communications in Eastern Turkey

Although considerable progress has been made during the past few years in extending the Turkish State Railways into the eastern parts of the country, adjacent to the frontiers of Soviet Russia and Persia, the difficult terrain has resulted in construction being a slow and tedious task, and there are still large areas with inadequate communications.

To make good one of the important deficiencies, the Turkish State Railways maintain an important long-distance motor service linking the Black Sea port of Trabzon (Trebizond) with the Persian frontier, *via* Erzerum. The route is 658 km. (409 miles) in length, and both passenger and goods services are maintained with motorbuses and lorries, respectively. The route traverses mountain passes which reach heights of about 9,840 ft. in the frontier zone, and therefore the services can be maintained only during the summer months, when the passes are reported clear of snow. This year, the services were reopened late in June, and it is hoped to maintain them up to the end of October, or even for some time in November.

The buses, each of which has a seating capacity for 17 persons, leave Trabzon on Mondays, Wednesdays, and Saturdays, at 7 a.m. A night is spent at Baiburt, which is on the proposed northern railway intended eventually to link Haidar Pacha with Artvin, near the Russian frontier. Another night is spent at Erzerum ; this is the railhead of the standard-gauge line from Ankara. Onwards, toward the Russian frontier, there is a railway of 2 ft. 6 in. gauge to Sarikamish, where the 5-ft. gauge Russian system begins. Sarikamish is about 76 miles inside Turkey, and the broad-gauge line thence to the frontier is owned by the Turkish State Railways.

After leaving Erzerum, the bus service proceeds to Karaköse, where the next night is spent. There was a Russian strategic railway extending from the main Russian railway system to Karaköse, but this has been dismantled and lain derelict since the last war. The road follows the course of this railway to the Turkish-Persian frontier. One bus a week proceeds right up to the frontier, but the other two stop at Bayazit, which is some miles to the west of the border. The former practice of allowing the buses beyond the frontier as far as the Persian Customs Station of Bazarghan (some 2 km. inside Persian territory) has been discontinued.

Traffic is relatively heavy, and the number of passengers always requires 2 buses to leave simultaneously with every departure from Trabzon. In addition, a lorry conveys luggage and other express goods.

Fares and luggage rates from Trabzon are as follow :—

	Fares	Express goods (per kg.)	Ordinary goods (per kg.)
Gümüshane	£T 4.37	2.25 Kurush	1.80 Kurush
Baiburt	£T 5.87	3 Kurush	2.40 Kurush
Erzerum	£T 10.20	5.25 Kurush	4.20 Kurush
Karaköse	£T 19.47	9 Kurush	7.20 Kurush
Bazarghan	£T 20.65	11.50 Kurush	9.20 Kurush

In addition to this road service of the Turkish State Railways, the Turkish Postal Administration provides a motor service between Trabzon and Erzerum twice weekly in each direction.

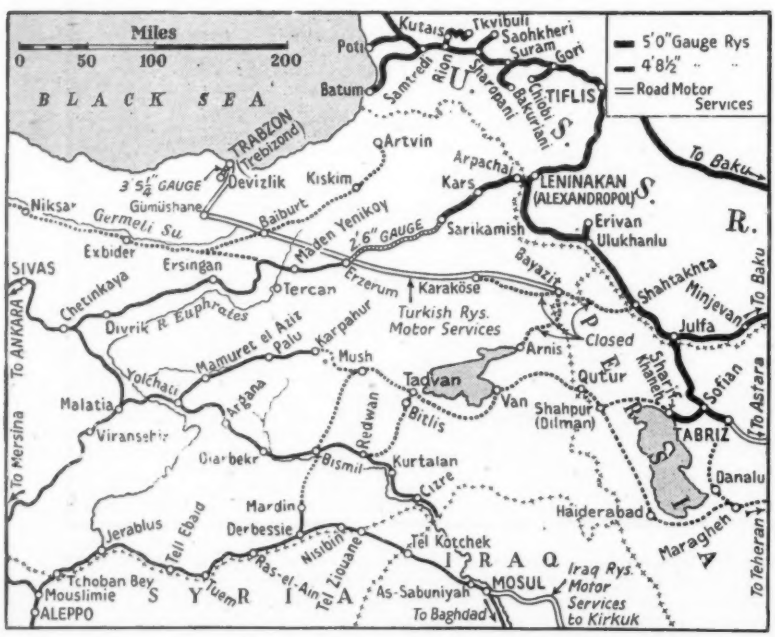
Sudan Railways Cinema Van

Some years ago, as part of the welfare work of the Sudan Railways a van, more or less rescued from scrap, was fitted up with an epidiascope and silent projector, and accommodation for an operator, and was supplied with a small portable generating-set. This vehicle made tours of the system and gave shows at wayside stations, where its visits did much to cheer the staff, particularly at the very-lonely stations.

Its possibilities in wartime became apparent to the Information Officer, who was able to obtain from the Ministry of Information, Middle East, a complete portable-projector, with sound-reproduction equipment. This was installed in the cinema van, but wooden boxes were made in the railway shops to enable the equipment to be transported also by lorry, to increase the range of service to villages away from the line.

The latest war-films, with Arabic commentaries, are shown, with shorts and comic films to vary the programmes. Regular itineraries are compiled, and the van continuously covers the system. It is not uncommon to have from 400 to 600 persons, drawn from the surrounding district, present at a small station when a show is given.

The possibilities of the travelling cinema, in the dissemination of knowledge, and in the education and enlightenment of the Sudanese people, particularly in respect of health, agricultural methods, and other subjects, are great ; and the evident success of the project should encourage development of the idea after the war.



Sketch map showing railways and road motor services in Eastern Turkey

Buenos Aires Transport Corporation

The Buenos Aires Transport Control Committee has submitted a report to the Minister of the Interior stressing the failure and inability of the Buenos Aires Transport Corporation, as at present organised, to fulfil the purpose for which it was established, namely, to provide the city with a cheap, modern, and efficient passenger-transport service (see also our issue of September 3, page 228). The report states that the corporation has failed even to incorporate the entire underground system, as the " E " line of the Compañia Hispano-Argentina de Obras Públicas y Finanzas, from Plaza Constitución to Boedo, has not yet been taken over and put into service, in accordance with the agreements made with that company. Neither have all the bus companies been taken over (the majority are still privately owned). The committee also points out that, of the large number of *colectivos* expropriated, only 450 have been bought outright, and of these 300 have had to be returned to their original owners, as the corporation has not been in a position to run them.

The report states that during the last financial year a deficit of over 5,500,000 pesos was incurred, and that the corporation's indebtedness, exclusive of the amounts owing to the pension fund and those incurred in connection with the expropriation schemes, were approximately 45,000,000 pesos, to which had to be added the issue of 40,000,000 pesos in debentures. It is proposed that the debenture issue be increased to 100,000,000 pesos, which, it is estimated, would enable the corporation to complete the expropriation of the most urgent services and leave a sufficient balance to meet its most-pressing obligations. It is proposed also that the 1,200 buses and 2,000 *colectivos*, the majority of which are in fairly-good condition, should be returned to service by their owners. It is pointed out that this would allow time for the repair and reconditioning of the 1,900 surface trams, which are in bad condition; once these were returned to service, the buses in worst condition could be withdrawn, and the other services expropriated, without any serious inconvenience to the travelling public

According to a Government Decree issued through the Ministry of the Interior, the municipality's share in the capital of the Buenos Aires Transport Corporation has been increased from

109,527,242 pesos to 128,016,136 pesos. This adjustment has been made as the result of the final capitalisation of the taxes and other payments, and of the debts owing to the municipality by the constituent companies at the time of their incorporation into the consortium. Of this sum, 29,242,072 pesos represents debts owed by the tramway, bus, and *colectivo* owners. The Decree provides that, until such time as the control committee has studied and determined the amount of the reversionary rights which must be allowed as accruing to the municipality in respect of the period which already has expired of the original concession in the case of each company, the corporation shall withhold delivery of one-third of the shares by which each company is at present represented on the board.

Questions in Parliament

Improvements in Train Lighting

Mr. W. R. D. Perkins (Stroud—C.) on October 19 asked the Parliamentary Secretary to the Ministry of War Transport whether he would consider further improvement of the lighting on long-distance inland trains.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary, Ministry of War Transport) wrote in reply: Improvements in train lighting were authorised in the early part of this year and in most of the railway passenger coaches now in use, these improvements have been carried out. I regret that I cannot encourage Mr. Perkins to hope for further improvements at present, not only for security reasons, but because of the shortage of the labour and material which would be required.

Travel for Relatives of Armed Forces

Mr. W. H. Mainwaring (Rhondda East—Lab.) on October 19 asked the Parliamentary Secretary to the Ministry of War Transport if the cheap travelling facilities to visit members of the forces extend to widowed mothers; and, if not, would he consider granting them the facilities thus provided.

Mr. Noel-Baker stated in a written answer: If members of H.M. Forces are in hospital, close relatives, including mothers, whether widowed or not, can obtain vouchers for cheap railway travel to visit them. If the patient is on the danger list, two such relatives can travel free. Wives and dependent children of members of the Forces may travel at reduced fares, irrespective of the purpose of their journey. Other relatives are not eligible for this concession and the Minister of War Transport would not feel justified in extending it at the present time, when passenger facilities are severely overtaxed.

Damage to Crops by Engine Sparks

Lord Fermoy (King's Lynn—C.) on October 19 asked the Parliamentary Secretary to the Ministry of War Transport whether, in view of the large number of fires caused to crops by railway engines this summer, he would see that all railway companies placed tin hoods over the stacks, as was done in America with such good results.

Mr. Noel-Baker in a written answer stated: The height of railway over-bridges and tunnels in this country makes it impracticable to fit our locomotives with the type of tin hood which is fitted in the United States. The British load gauge also makes it inadvisable to adopt other devices which have been successfully used abroad because their adoption would reduce the steaming capacity of the engines and would thus seriously affect the operating efficiency of the railway system. I would like to assure Lord Fermoy, however, that the railway companies are taking all practicable measures to reduce the risk that crops will be destroyed by fires caused by sparks from locomotives and that the matter is receiving my close attention.

Travel Facilities for M.Ps.

Mr. D. L. Lipson (Cheltenham—Ind.) on October 21 asked the Financial Secretary to the Treasury what would be the additional financial burden to the State, when account was taken of the fact that the surplus profit of the railways above an agreed sum reverted to the State, of giving members of Parliament for the duration of the war passes between London and their constituencies; and would he indicate how the amount was arrived at.

Mr. R. Assheton (Financial Secretary to the Treasury) in a written answer stated: The current estimates provide for an expenditure of £35,000 for members' travelling facilities. The approximate cost of providing members with the additional travel facilities that would be offered by a permanent pass between London and their constituencies would be £67,000. Under the present financial arrangements between the railway companies and the Government, the provision of such extra facilities would not place any additional burden on the Exchequer. A system of permanent passes would, however, give travelling facilities in excess of those authorised by Parliament and would prevent any check being kept to ensure that the moneys provided by Parliament were expended solely for the purpose for which they were voted.

Transport of Seed Potatoes

Squadron-Leader P. W. Donner (Basingstoke—C.) on October 21 asked the Parliamentary Secretary to the Ministry of War Transport whether the statement in the Emergency Powers (Defence) Railways (Transport of Seed Potatoes) Order (S.R. & O., No. 1334 of 1943) that it had been made by the Minister of War Transport, was to be taken to mean that it was personally approved by him, or that it was signed by an assistant secretary under a general authority granted by him.

Mr. Noel-Baker stated in a written answer: The statement to which Squadron-Leader Donner refers is to be taken to mean that the Direction has been duly issued and is one for which the Minister of War Transport is responsible. In the case referred to I approved the Direction before its issue.

Post-War Plans for Roads

Captain W. F. Strickland (Coventry—C.) on October 20 asked the Parliamentary Secretary to the Ministry of War Transport, whether the plans which were being prepared in his department for the post-war construction of ring roads and radial arteries were yet sufficiently far advanced to be published in outline and when it was proposed to lay them before Parliament.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary, Ministry of War Transport) stated in a written answer: Many plans for the improvement of existing roads and for the construction of new roads have been or are being prepared. They are in varying stages of completion; none of them can be carried out until the war is over, and their completion will, no doubt, be spread over a period of years. Before they are begun, they will have to be examined in the light of other decisions about national planning which the Government will have made. It would, therefore, be premature to publish any general plan for highways at present. Where the sanction of Parliament is required for any given plan the necessary steps to obtain that sanction will be taken by the responsible highway authority.

Glamorganshire Toll Gates

Sir William Jenkins (Neath—Lab.) on October 20 asked the Parliamentary Secretary to the Ministry of War Transport (1) what number of toll-gates there were in Glamorganshire; the tariff charges in each case; the number of persons employed; the number of hours worked in each week; the wages paid; and the names of owners of the toll-gates; and (2) what steps had been taken to remove the Penarth toll gate; what extra petrol was being used by tradesmen's vehicles between Cardiff and Penarth by travelling over Leckwith Hill, Glamorgan, instead of over the toll-gate road; if he would take immediate steps to make this road a free public road; and would he state who the owners were.

Mr. P. J. Noel-Baker in a written answer stated: The only toll-gates in Glamorganshire are on the Cardiff—Penarth road which is owned jointly by Mountjoy Limited and Plymouth Estates Limited. The charges per day are as follow:—

Horse and cart	4d.
Horse and trap	6d.
Lorry	2s.
Private van	1s.
3-wheeled combination	6d.
Motorcycle	3d.

Vehicles plying for hire pay according to their class, but the payment permits of only one crossing. Military and other Service vehicles up to a gross weight of 15 tons are free. There are three collectors, two roadmen and a foreman who is engaged part-time only. The Chief Collector works 60 hours, and the other men work 48 hours a week. The wages of the three collectors amount to £620, and those of the roadmen (including the part-time wages of the foreman) amount to £416 a year.

Institute of Transport Students and Graduates

Sir William Wood, President of the Institute of Transport, addressed the Institute's Metropolitan Graduate & Student Society at a meeting on October 23, held at the Institution of Electrical Engineers, Thames Embankment, W.C.2.

Sir William Wood recalled a former visit to the Society when the late Lord Stamp had spoken of the need to look at transport as a whole, and had urged members to take an interest in all the Society's transactions and not only in those which referred to some particular branch of the industry. The President went on to examine the Society's programme of meetings, and said that this showed how wide might be the appeal and usefulness of what might appear to be specialised subjects.

After discussing the dangers of the tendency to undue specialising in large undertakings, he spoke of statistics, and the need to ensure that figures regularly taken out were really needed, and of the desirability of knowing exactly how the figures were compiled. He warned members to beware of averages when the variations inside them were not known.

TRAFFIC INCREASE ON TRANS-CANADA AIR LINES.—Mr. W. F. English, Assistant Vice-President of Trans-Canada Air Lines, stated recently that traffic on the system—passenger, mail, and express—had increased by 100 per cent. in two years.

Notes and News

Antofagasta (Chili) & Bolivia Railway Co. Ltd.—The usual half-yearly interest on the Bolivia 5 per cent. debenture stock will be paid on November 1.

South African Railways Earnings.—For the period from September 12 to October 9 inclusive, earnings of the South African Railways amounted to £3,352,628, compared with £3,184,471 for the corresponding period of 1942.

Madras Railway Annuities.—It is notified that in accordance with the provisions of the Madras Railway Annuities Act, 1908, a total of £6,197,404 6s. 3d. was on October 6, 1943, invested in the sinking fund for Annuities Class "B."

German Rolling Stock in Turkey.—The German radio announced on October 13 that a large consignment of German railway wagons and locomotives had just arrived in Istanbul. It was added that "all outstanding deliveries under the existing commercial agreements had thus been practically completed."

Renold & Coventry Chain Co. Ltd.—For the year to June 27, 1943, the net profit, after making provision for taxation and depreciation, was £97,461 (£100,739) and £27,022 (£24,924) was brought in. The sum of £45,000 is again transferred to contingencies reserve, and the final ordinary dividend is 7 per cent., again making 10 per cent. for the year, leaving £25,842 to be carried forward. Throughout the year sales have been maintained at a high level. War-time taxation is the cause of the profit being virtually unchanged.

Good London Transport Driving Record.—More than 12,000 London Transport road vehicle drivers have earned Safety First awards in the 1942 competition. The full results have now been determined, and the following is a complete list :—

25 years cross	4
21-24 years star bar	137
20 years brooch	75
19 years bar	107
16-18 years bar	697
15 years brooch	332
14 years bar	345
11-13 years bar	1,840
10 years gold medal	608
9 years bar	596
6-8 years bar	3,153
5 years silver medal	947
1-4 years diploma	3,366
	12,207

The four drivers earning the 25-year cross for entire freedom from accident have been received at 55, Broadway, Westminster, and congratulated by Lord Ashfield.

Institution of Electrical Engineers.—The Council of the Institution of Electrical Engineers, which has had under consideration for some time the question of making technical meetings accessible to those who may be interested, but who may consider that their technical experience and educational attainments do not suffice to admit them to any form of membership, has ordered that a person of that category who is interested in the proceedings at ordinary meetings, section meetings, local-centre meetings, and informal meetings, shall be provided by the Secretary with an application form, on the completion of which, and on payment of a fee of 7s. 6d. to cover administration costs, he may receive notices of meetings and an invitation card which will serve as a title of admission to the technical meetings of the Institution during the forthcoming session in London and in the provinces. The possession of the invitation card will not confer on the holder any status within the framework of the Institution, nor will he have the right to join in discussions without special permission from the chair. Those interested, whether they reside in London or in the provinces, should apply to the Secretary of the Institution.

Babcock & Wilcox Limited.—In respect of the year 1943 an interim dividend of 4 per cent., less tax, on the ordinary stock has been declared (same).

Rhodesia Railways Debenture Stock.—Rhodesia Railways Limited has purchased and cancelled £207,120 of 4½ per cent. debenture stock, leaving £20,573,053 outstanding, out of an issue in 1937 of £21,750,000.

Balerno Branch to be Closed.—On and from November 1, the L.M.S.R. is closing to passenger traffic the Balerno branch, immediately to the south of Edinburgh. The stations affected are Hailes Halt, Colinton, Juniper Green, Currie, and Balerno. These stations will remain open for parcels and freight traffic.

New Brazilian Transport Clearing House.—A clearing house for various transport companies has been inaugurated in Brazil to facilitate door-to-door transport between Rio de Janeiro and certain other cities. It includes several rail and road transport systems. Freight rates may be paid either at the point of origin or at destination. It is probable that this service may be extended to further cities.

New Swedish Ticket Machine.—A new type of ticket-selling machine is reported to have been offered by the L.M. Ericssons Kassaregister Aktiebolaget to the Swedish State Railways. The offer has been accepted and an experimental unit is now being manufactured for the sale of tickets on the road motor services of the Swedish State Railways; it is expected that this will be delivered within a few weeks.

Mexican Government Railway Loans.—The Guaranty Trust Company of New York announces that the agreement entered into in November, 1942, between the United States of Mexico and the International Committee of Bankers on Mexico, with regard to the resumption of service on the Mexican Public Debt, is now operative. Among the loans concerned are the Tehuantepec National Railway 5 per cent. and and 4½ per cent. gold loans, 1953. The British Treasury has granted permission under the Defence (Finance) Regulations, 1939, for bondholders to accept this offer of the Mexican Government.

British Engineers' Association.—At the thirty-first annual general meeting of the British Engineers' Association, held on October 14 at the Waldorf Hotel, London, the members unanimously supported a recommendation by the Council that membership be widened so as to provide for membership of the B.E.A. by sectional trade associations, the members of which are concerned primarily with the mechanical-engineering industry. Since the inception of the Association in 1912, membership has been restricted to individual firms, of which some hundreds now participate in its work. It is expected that the extension to which agreement was given at the meeting will facilitate closer co-operation between those with mutual interests. The Director, Mr. A. W. Berry, M.I.E.E., outlined some of the services rendered to members, and referred to the close contacts maintained by the Association with the appropriate Government departments. He mentioned the successful outcome of representations to the Chancellor of the Exchequer in respect of Tax Reserve Certificates and also to the submission by the Association of memoranda on the effects on productive industry of excess-profits taxation.

Swedish State Railways Budget.—The Swedish State Railways have asked for an allowance of about kr. 49 million in the 1944-45 budget. This amount includes kr. 8½ million for work on the electrification of the line between Östersund and Storlien (101 miles), and kr. 10 million for the

British and Irish Railway Stocks and Shares

Stocks	Highest 1942	Lowest 1942	Prices Oct. 22, 1943	Prices Rise/Fall
G.W.R.				
Cons. Ord.	58	39	60	+ ¼
5% Con. Pref. ...	115½	105½	111½	+ 1
5% Red. Pref. (1950)	109½	103½	107	—
5% Rt. Charge ...	133½	123½	126½	—
5% Cons. Guar. ...	130¾	121½	124½	+ 1
4% Deb.	117	105	112	+ 2½
4½% Deb.	118	108	112½	+ 2
4½% Deb.	125	113	117½	—
5% Deb.	137	127	128	—
2½% Deb.	77	70	74½	—
L.M.S.R.				
Ord.	28½	16⅝	31½	—
4% Pref. (1923) ...	63½	50½	60½	—
4% Pref.	76½	67½	74½	—
5% Red. Pref. (1955)	103¾	94¼	103½	—
4% Guar.	104½	97½	100	—
4% Deb.	108¾	101½	106	+ 1
5% Red. Deb. (1952)	111	107½	109½	—
L.N.E.R.				
5% Pref. Ord. ...	9¾	2⅞	9½	+ ⅛
Def. Ord.	5	1⅛	4¼	+ ⅛
4% First Pref. ...	62	49½	60	—
4% Second Pref. ...	32½	18½	32½	+ ⅛
5% Red. Pref. (1955)	95½	79	98½	—
4% First Guar. ...	98	88	96	+ ⅛
4% Second Guar. ...	90	78	83	+ ⅛
3% Deb.	85	76	83	+ 1⅛
4% Deb.	106⅜	100½	105	+ 1½
5% Red. Deb. (1947)	106	103	103	—
4½% Sinking Fund Red. Deb. ...	106	102½	105½	—
SOUTHERN				
Pref. Ord.	77	61½	76½	+ ⅛
Def. Ord.	23½	14½	24½	— ⅛
5% Pref.	112½	104	111½	+ 1½
5% Red. Pref. (1964)	110⅜	105½	111½	—
5% Guar. Pref. ...	131	121½	123½	—
5% Red. Guar. Pref. (1957)	115½	109½	111½	—
4% Deb.	116	104½	110	+ 1½
5% Deb.	134	125½	128	—
4% Red. Deb. (1962–67)	110¾	106	107½	—
4% Red. Deb. (1970–80)	111	106½	108½	—
FORTH BRIDGE				
4% Deb.	109 7/8	108	106	—
4% Guar.	105½	100	103½	—
L.P.T.B.				
4½% "A"	122½	111	115½	—
5% "A"	131½	122	125½	+ 1
3% Guar. (1967–72)	95⅜	97⅛	98	—
5% "B"	121	111½	116½	—
"C"	56½	38	69	—
MERSEY				
Ord.	27½	20½	32	—
3% Perp. Pref. ...	61½	56½	65	+ 1
4% Perp. Deb. ...	102⅜	99⅜	103	—
3% Perp. Deb. ...	80¼	76	79	—
IRELAND				
BELFAST & C.D.				
Ord.	9	4	6½	+ ½
G. NORTHERN				
Ord.	29¾	12½	20	— 1/16
Pref.	—	—	40½	
Guar.	—	—	58	+ 2
Deb.	—	—	75½	+ ½
G. SOUTHERN				
Ord.	25	10	21½	+ 1⅜
Pref.	29	12⅜	23½	+ 1⅜
Guar.	53	35⅜	46	+ 3½
Deb.	71½	55½	72	+ 2

§ ex-dividend

doubling of tracks between Skövde and Falköping, and between Palsboda and Ballsberg. A sum of kr. 2¾ million is asked to defray expenditure on defence measures on the railways.

Crossing Accident at Leytonstone, L.N.E.R.—A train carrying members of the company's staff crashed into the level-crossing gates at Leytonstone, L.N.E.R., early on October 25. No one was injured, but the lines to and from Liverpool Street were blocked for about one hour.

L.M.S.R. Gas-Consumption Saving.—The Chief Fuel Economy Officer of the L.M.S.R. stated recently that the consumption of gas throughout the system for the six months ended June 30 last had decreased by approximately 70,000,000 cu. ft., or 9 per cent., as compared with the corresponding period of 1942. Bearing in mind a number of factors which tended to increase the user, including additional canteens, Home Guard activities, and fire-watching, the saving, which represented one of nearly 2,500 tons of coal, was considered to be very satisfactory.

Dorman Long Debenture Redemption.—Dorman Long & Co. Ltd. has given notice to redeem on January 17, 1944, the whole of its outstanding £3,031,560 five per cent. mortgage redeemable debenture stock with 5 per cent. premium and interest to that date. Towards this repayment 2,094,334 new ordinary shares of £1 each are to be offered for subscription by holders of preferred ordinary share and/or ordinary shares on the register at October 25, at the price of 27s. each in the proportion of one new ordinary share for each preferred ordinary share and/or ordinary share held. The new ordinary shares will rank for dividend in respect of the current financial year, but not in respect of the past year ended September 30, 1943.

Science and the Coal Industry.—At a meeting of the North Eastern Section of the Institute of Fuel at Newcastle-on-Tyne on October 18, Mr. J. G. Bennett, Director of the British Coal Utilisation Research Association, spoke on "Science and the Coal Industry." He said that it had become almost a parrot cry to say that the days of using coal merely as a fuel had passed, and that we must regard it as a raw material; but very few really had attempted to understand what that implied. He ventured to predict that there was no major raw material produced from the earth's crust which was likely to see such an amazing transformation in the manner of its use during the next 20 years. That would come about by the application of the scientific method both to the nature of coal viewed as a chemical compound and to the utilisation of coal as a source of energy, and to the co-ordinated activities of scientists, engineers, and industrialists.

John Thompson Engineering Co. Ltd.—Colonel S. John Thompson, D.S.O., in his address at the eighth ordinary general meeting of the John Thompson Engineering Co. Ltd., said that the net profit for the "group" for the year 1942 (before taxation) showed a small decrease as compared with the previous year, although the turnover was considerably higher. Increased cost of labour and materials, particularly in the erection of plant, had decreased the margin of profit. During the year a comprehensive staff pension scheme had been inaugurated. The company's reserves and unappropriated profit in the group were substantial, and the present financial position of the group companies continued to be strong. The trading profit of the parent company, including dividends declared by the subsidiary companies, amounted to £138,693. The total invested funds of the company and its subsidiaries at December 31, 1942, at the market value then ruling, was £473,950.

Joint Meeting of Institutions of Mechanical and Electrical Engineers.—At a joint meeting of the Institution of Mechanical Engineers with the Institution of Electrical Engineers, in the meeting hall of the latter, Savoy Hill, W.C.2, on November 4 at 5.30 p.m., papers will be read on "Bonded Deposits on Economiser Heating Surfaces," by Messrs. J. R. Rylands and J. R. Jenkinson, and on "Causes of High Dewpoint Temperatures in Boiler Flue Gases," by Mr. W. F. Harlow.

Argentine State Railways Tariff-Increase.—In accordance with a Decree issued by the Argentine Ministry of Public Works, the 2 per cent. increase on certain goods rates authorised (as recorded in our issues of August 6, page 126, and September 17, page 292) for the private railways is to be extended to the State Railways. The additional revenue obtained will be used to cover the wage increases of 5 per cent. and 10 per cent., respectively, recently granted to the single and married personnel of the State lines (see our issue of September 24, page 304).

Ransome & Marles Bearing Co. Ltd.—Sir Albert Bennett, in the course of his address at the 27th annual general meeting, said that in view of the difficulty of forecasting the actual circumstances which might arise at the end of hostilities the board attached great importance to increasing reserves to the maximum amount that the incidence of taxation would allow. This company's industry was dependent on the whole field of industrial activities, and its prospects therefore depended on the speed with which the great industries, its customers, could get back into peace-time production. He could say with confidence that whatever conditions arose the company would hold its own in the ball-bearing industry of this country.

Egyptian Delta Light Railways Limited.—Gross earnings in the year ended March 31, 1943, amounted to £476,360 (£352,005) and working expenses, including £30,000 (same) provision for deferred renewals, were £327,686 (£262,608), giving an operating ratio of 68·79 per cent., compared with 74·60 per cent. The balance carried to net revenue account is £148,674 (£89,397), which, with interest and dividends received from subsidiary companies, gives a total of £153,131. After providing for debenture charges, British income tax and N.D.C., Egyptian tax, and £24,159 proportion of profit due to the Egyptian Government, there is a balance of £27,603 (£7,898) to which must be added £46,080 brought forward, making a total of £73,683. The dividend of 2½ per cent. already announced on the 5½ per cent. cumulative preference shares requires £26,019, leaving £47,664 to be carried forward.

Great Southern Railways (Eire) Reorganisation Plan.—The directors of the Great Southern Railways Company have issued a circular to stockholders in favour of an approach to the Eire Government for the formation of a statutory company to acquire the existing company. The capital of the new company is to be £20,000,000, made up of £4,000,000 in ordinary stock and £16,000,000 in 3 per cent. Government-guaranteed redeemable debenture stock, and the new company is to have a chairman nominated by the Government, which will be asked to give the guarantee proposed. The issued capital of the existing company is £5,024,113, and the 4 per cent. debenture stock amounts to £7,076,972. These two amounts are to be absorbed into the new capital in certain stated proportions, and it is proposed to use £7,951,444 of the new guaranteed stocks for general improvement of the system.

White Pass & Yukon Railway Co. Ltd.—This company will pay on December 1 the interest amounting to 35½ per cent. which will be accrued and paid up to that date on the 7 per cent. prior lien debenture stock.

Accident at Maiden Lane Junction, L.M.S.R.—Eight wagons became detached from a locomotive during shunting operations at Maiden Lane Junction on October 25. They struck a signal cabin, which caught fire. Trains on the L.M.S.R. Broad Street line were delayed.

South Indian Railway Co. Ltd.—There will be payable on January 1, 1944, a final dividend of 2½ per cent., being 1¾ per cent. guaranteed interest and ¾ per cent. from surplus profits, making 4½ per cent. for the year to March 31, 1943. For the previous year the total distribution was the same.

L.N.E.R. Staff College.—A college for the training of members of the operating staff of the L.N.E.R. is to be opened shortly at Darlington, and will be under the direction of Mr. T. B. Hare, who, as recorded in our September 17 issue, was released recently from his position as District Superintendent, Darlington, for special duties. Grantley, formerly the home of the late Sir Vincent Raven, is being equipped for the purpose; the college will be residential.

Korean Transport Co-ordination.—With a view to co-ordinating and rationalising transport in Korea, all Korean transport undertakings were merged recently into the newly-formed Korean Land & Sea Transport Company, which has a share capital of Yen 50,000,000. Foremost among its constituents were the Korean Transport Company (share capital Yen 25,000,000), and the Korean Harbour Company (share capital Yen 13,500,000). The arrangements were made by the Japanese controlling authorities, of course.

Locomotive Fuel Economy.—At a fuel-economy conference held at the Central Library, Manchester, on October 20, a sequel to that held at Euston on September 29 (see our October 8 issue, page 368), Mr. L. P. Parker, Locomotive Running Superintendent (Eastern Section), Southern Area, L.N.E.R., read a paper on "Locomotive Fuel Economy." He said that the railway companies had appointed 46 inspectors (additional to regular staff) for locomotive fuel-economy purposes. Of the 200,000,000 tons of coal produced yearly in this country, the railways used about 16,000,000 tons, of which nearly 14,000,000 tons were burned in locomotives. The fact that, during the war, when the best coal available largely had given place to unfamiliar types, the engines had "not done so badly" said something for the enginemen's skill. "Opencast" coal-getting was being developed, and the companies' experiments showed that some qualities gave "quite good results" if screened before use; they had agreed to accept nearly 750,000 tons a year of suitable varieties as soon as available. One railway was saving 6,000 tons of coal a year by the use of scrap wood for steam-raising. Mr. George Mills, Divisional General Manager, Southern Area, L.N.E.R., presided at the conference.

Railway Stock Market

A further contraction of business in Stock Exchange markets has been reflected by an easier trend of values. Nevertheless, there was again little selling. Buying was on a small scale, mainly because markets were dominated by a widespread disposition to await results of the Three-Power Conference in Moscow. In accordance with the prevailing tendency, business in home railway securities slackened, after the general improvement shown last week. Moreover, Argentine railway securities remained under the influence of uncertainty as to political developments in the republic; sentiment was unresponsive to reports that the railway mission's talks with the authorities are not only to include existing difficulties, but also those relating to the position and outlook in the post-war period.

Had there not been an immediate and timely official denial of week-end rumours of negotiations for an amalgamation of the four main-line railway companies, sharp movements might have been witnessed in home railway stocks. There is, however, a disposition to expect that Lord Leathers, Minister of Transport, may shortly make a statement relating to post-war transport policy; but this will doubtless be in general terms. It is realised that the post-war status and organisation of the railways would have to be the subject of lengthy negotiations, particularly as post-war plans are generally expected to include not only co-ordination, but also the development of transport after the war. In any case it is generally expected that the existing financial agreement, which should allow of the continuance of dividends at around last year's rates, will continue in force until at least one year after the war. Stockholders are receiving only a very modest return, despite the large increase in railway revenue, and as time proceeds, demand for modification of the agreement to permit of a more equitable return doubtless will increase. Under the agreement as it now stands, no dividends are possible on L.N.E.R. preferred and deferred stocks. This appears to be the only instance of an important concern playing a vital part in the war whose junior stocks are precluded from any distribution. Nevertheless, whatever the future may hold, there is no reason to assume that the railways and their stockholders will be treated unfairly, and the high yields shown on junior home railway stocks appear to be unjustified both from the near-term and long-term outlook. In any case, the post-war outlook, like that of other important industries, will turn in a large measure on the success achieved in securing full employment of the country's labour power and resources.

Compared with a week ago, Great Western ordinary has reacted from 60¼ to 59⅜ at the time of writing. On the other hand, the 4 per cent. debentures further improved from 110 to 112½; the 5 per cent. preference was a point better at 112; the guaranteed stock held the rise to 124½. Among L.M.S.R. issues, the ordinary was 32, compared with 32¼, the 1923 preference was maintained at 60¼, and the senior preference fractionally lower at 74¼. L.M.S.R. 4 per cent. debentures gained a point to 106; the guaranteed stock was again at par. L.N.E.R. second preference declined on balance from 32⅝ to 32¼; the first preference at 60 was the same as a week ago. This railway's 3 per cent. debentures moved up from 81½ to 83, and the 4 per cent. debentures from 103½ to 104½; the first and second guaranteed stocks were better at 96 and 88 respectively. Southern deferred eased from 24¼ to 24⅛, but the preferred strengthened from 76¼ to 76¾. In accordance with the improved tendency in prior charges, Southern 4 per cent. debentures (110) were better, and the 5 per cent. preference a point higher at 111½. London Transport "C" moved back slightly to 69; but in this case also, prior charges were better, fractional gains having been shown in the "A" and "B" stocks.

An indication of the general trend in Argentine stocks was provided by a decline in B.A. Gt. Southern ordinary from 15½ to 15; the 5 per cent. preference was 27½, compared with 28½, and the 4 per cent. debentures 63, compared with 65. Elsewhere, United of Havana debentures rallied from 34 to 36. Leopoldina debentures at 57½ were only fractionally lower on balance. San Paulo ordinary moved back to 62. Canadian Pacifics showed a fractional decline.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1941/2	No. of Weeks	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Totals 1941/2	Aggregate traffics to date: Increase or decrease	Shares or stock	Prices: Highest 1942	Prices: Lowest 1942	Prices: Oct. 22 1943	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	17.10.43	28,570	+ 9,400	42	1,179,280	887,240	+ 292,040	Ord. Stk.	14	7⅜	14½	Nil
	Argentine North Eastern ...	753	16.10.43	14,706	+ 894	16	218,916	215,274	+ 3,642	,,	6¼	3	7	Nil
	Bolivar	174	Sep., 1943	5,756	+ 238	40	47,669	40,709	+ 6,960	6 p.c. Deb.	19⅜	10	20½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	20⅛	9	22½	Nil
	Buenos Ayres & Pacific ...	2,807	16.10.43	106,500	+ 19,500	16	1,368,300	1,355,340	+ 12,960	Ord. Stk.	7⅛	4	7½	Nil
	Buenos Ayres Great Southern	5,080	16.10.43	165,660	+ 15,300	16	2,258,700	2,052,240	+ 206,460	Ord. Stk.	12½	7⅛	14½	Nil
	Buenos Ayres Western ...	1,930	16.10.43	59,640	+ 7,440	16	768 600	774,600	− 6,000	,,	12⅜	6	13	Nil
	Central Argentine	3,700	16.10.43	144,270	+ 24,732	16	2,046,573	1,931,157	+ 115,416	,,	9½	4 7/16	9	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	3½	2⅛	4	Nil
	Cent. Uruguay of. M. Video	972	16.10.43	31,925	+ 10,263	16	468,031	327,661	+ 140,370	Ord. Stk.	8	4	7	Nil
	Costa Rica	262	Aug., 1943	25,656	+ 11,729	8	48,907	26,688	+ 22,219	Stk.	16½	11	15	Nil
	Dorada	70	Sep, 1943	24,660	+ 5,360	39	196,807	137,705	+ 59,102	1 Mt. Db.	90½	89	95½	6 5/8
	Entre Rios	808	16.10.43	19,998	+ 1,032	16	310,128	288,468	+ 21,660	Ord. Stk.	33	4½	7	Nil
	Great Western of Brazil ...	1,030	16.10.43	22,100	+ 5,400	42	654,300	436,400	+ 217,900	Ord. Sh.	9/-	9/-	32/6	Nil
	International of Cl. Amer. ...	794	Aug., 1943	$540,396	+ $242,201	32	$5,025,556	$4,308,750	+ $716,806	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	..	—	—	—	1st Pref.	1⅛	5/3	2	Nil
	La Guaira & Caracas... ...	22¾	Sep., 1943	8,035	− 555	39	76,460	63,355	+ 13,105	5 p.c. Deb.	11⅛	5	86½	Nil
	Leopoldina	1,918	16.10.43	38,543	+ 7,424	42	1,421,480	1,260,204	+ 161,276	Ord. Stk.	6¾	3½	6	Nil
	Mexican	483	14.10.43	ps. 357,700	+ ps.77,500	14	ps.6,091,600	ps. 4,316,800	+ ps. 1,774,800	Ord. Stk.	1	⅛	1½	Nil
	Midland Uruguay	319	Aug. 1943	14,706	+ 4,213	41	31,160	23,107	+ 8,053	—	—	—	—	—
	Nitrate	382	15.10.43	6,689	− 4,087	41	121,639	150,871	− 29,232	Ord. Sh.	77/-	3½	78/9	Nil
	Paraguay Central	274	15.10.43	$5,751,000	+ $1,392,000	16	$84,423,000	$58,868,000	+ $23,555,000	Pr. Li. Sck.	53	40	70	8 4/7
	Peruvian Corporation ...	1,059	Sep., 1943	107,267	+ 21,631	13	314,208	251,242	+ 8,053	Pref.	19⅝	5⅛	14	Nil
	Salvador	100	Aug., 1943	c 91,000	+ c 42,000	9	c199,000	c 128,000	+ c 71,000	—	—	—	—	—
	San Paulo	153⅛	17.10.43	52,048	+ 8,717	42	1,814,355	1,543,582	+ 270,783	Ord. Stk.	59	41	62½	3 4/7
	Taltal	160	Sep., 1943	7,175	+ 2,240	13	16.905	16,660	+ 245	Ord. Sh.	41/-	23/-	28/9	Nil
	United of Havana	1,301	16.10.43	46,012	+ 6,907	16	754,654	628,470	+ 126,184	Ord. Stk.	8½	2½	5	Nil
	Uruguay Northern	73	Aug. 1943	1,451	+ 395	9	2,838	2,198	+ 640	—	—	—	—	—
Canada	Canadian Pacific	7,034	14.10.43	1,170,000	+ 126,000	41	45,604,400	39,454,400	+ 6,150,000	Ord. Stk.	16¾	9 7/16	16	Nil
India†	Barsi Light	202	Aug., 1943	15,285	+ 2,003	22	107,055	76,587	+ 30,468	—	—	—	—	—
	Bengal-Nagpur	3,267	July, 1943	955,725	+ 17,325	17	4,184,625	3,553,425	+ 631,200	Ord. Stk.	102½	88	102½	3 9/11
	Madras & Southern Mahratta	2,939	31.7.43	273,075	− 81,874	18	3,324,300	2,778,222	+ 546,078	,,	105½	87	107½	6 2/3
	South Indian	2,349	20.7.43	199,562	+ 16,961	16	2,219,544	2,054,903	+ 164,641	,,	103¾	88 7/8	103½	4 16
Various	Egyptian Delta	—	10.9.43	13,189	+ 766	24	229,115	176,202	+ 52,913	Prf. Sh.	5½	1⅛	2½	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	44	35	40	8¾
	Midland of W. Australia ...	277	Aug.,1943	36,199	+ 7,460	9	70.424	56,608	+ 13,816	Inc. Deb.	95	90	100	6
	Nigerian	1,900	31.7.43	63,520	+ 7,084	16	1,130,531	980,707	+ 149,824	—	—	—	—	—
	South Africa	13,291	4.9.43	842,927	+ 41,649	22	19,084,646	17,229,868	+ 1,784,778	—	—	—	—	—
	Victoria	4,774	Mar., 1943	1,595,068	+ 255,764	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛

† Receipts are calculated @ 1s 6d. to the rupee

Argentine traffics are given in sterling calculated @ 16⅔ pesos to the £

§ ex dividend